

# THE CONDOR

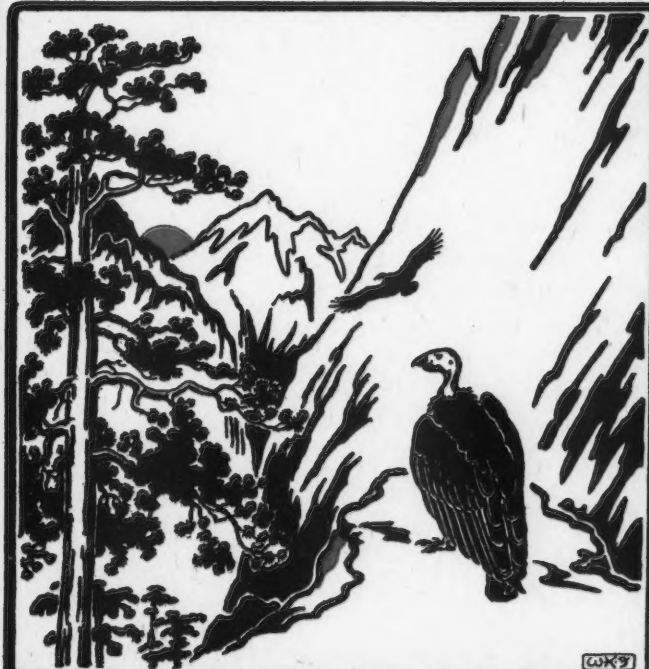
A Magazine of Western  
Ornithology



Volume XXVI

July-August, 1924

Number 4



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COOPER ORNITHOLOGICAL CLUB

# THE CONDOR

A Magazine of Western Ornithology

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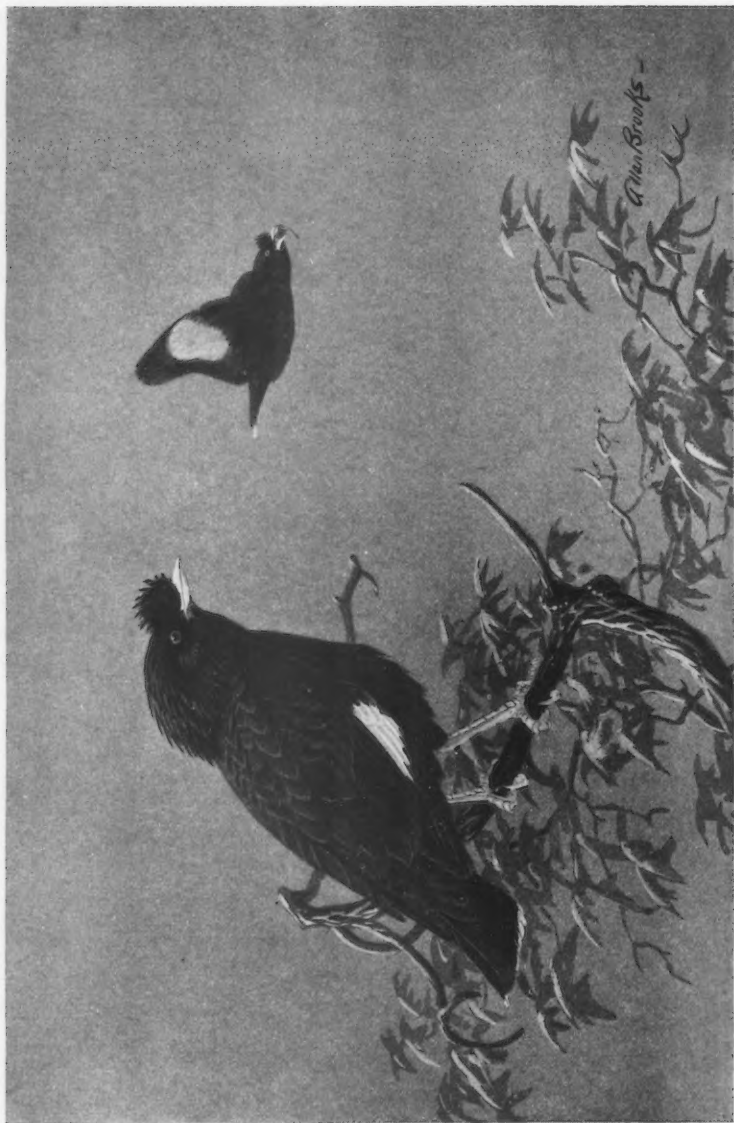


Fig. 41. THE CHINESE STARLING OR CRESTED MYNAH (*Aethiopsar cristatellus*).

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## THE STARLING FAMILY AT HOME AND ABROAD

(WITH FRONTISPIECE)

By CASEY A. WOOD

NOW THAT the so-called Chinese, or Japanese, Starling (*Aethiopsar cristatellus*) has gained a firm foothold in British Columbia, and is said to be advancing not only inland but southward, it becomes an object of economic interest to all dwellers along the Pacific Coast. For this reason I have undertaken, at the request of Dr. Grinnell, to add my own experience of the Starling in various countries (both of native and introduced varieties) to the more extensive observations of others, to the end that we may consider the probable future of this foreign importation and speculate on the role it is likely eventually to play in the biological balance of this section of North America.

*Sturnus vulgaris*. European Starling. For many reasons this Starling is the most widely known of the whole family. Its native range includes western and central Europe and portions of Asia. It winters in Africa and has penetrated as far north as Greenland. The species has been artificially spread to the remotest parts of the earth, including New Zealand, Australia, Canada and the United States. Not only does it flourish in New York and New England, but its more recent spread or introduction to the mid-western states and Oregon has been announced.

E. H. Forbush says (Circular 45, Mass. State Board of Agriculture, Feb., 1916) that this bird was introduced into New York City in 1890 and 1891. On the first occasion 80 birds were liberated; the next year, 40 more. In less than two generations it has increased greatly in numbers and has spread almost as rapidly as did the House Sparrow. These results are, of course, due to fitness and ready adaptation to a new and pleasing environment. The European Starling is a hardy, resourceful, attractive, prolific, pugnacious and practically omnivorous animal, endowed with a high degree of intelligence. Two broods are raised, some say three, each year. Possessed of these qualities, and with few effective enemies, it is small wonder that this species has occupied American birdland with marked success.

It must not be forgotten that in Europe, and especially in England, where the Starling is one of the commonest birds, its economic status still remains unsettled. It is conceded that it destroys worms, grubs, snails and a number of noxious insects, and the benefits thus conferred on the farmer may exceed the damage inflicted on fruits and orchards. It is, on the other hand, widely and loudly blamed for "mass" attacks on small fruits, when very large flocks co-operate to destroy whole acres of currants, raspberries, etc. S. H. Goodwin (Bird-Lore, 1908, p. 130) furnishes a report from English horticulturalists on this subject. I quote briefly a few witnesses, who

voice an average opinion. "The Starling is a useful bird, foraging for the larvae of craneflies and wireworms; rids the sheep of a few of their ticks; but in a fruit district it comes in droves into the strawberries and attacks the cherries wholesale; also peas, apples, plums and raspberries." Another says that he does not grudge the blackbirds and thrushes their toll of fruit in return for their song, but he regards the Starlings with different feelings. They threaten in his neighborhood the utter destruction of the small fruit and other crops. "They come in millions, in flocks that darken the sky, and the noise of their flight is like the roar of the sea. Their numbers increase each year."

From Kent, the garden of England, comes the cry: "The starling is a terror, and you must have a gun always in your hand, or woe betide the cherries; they come in thousands." And the same tale is told by the orchardists in Switzerland and the south of France; also from New Zealand we hear similar complaints. While it must be borne in mind that the bird's standing as to usefulness or otherwise in one country is not a safe criterion as to what may happen when it is introduced into another with different fauna, flora and climate, it seems plain from Mr. Forbush's report that the Starling in Massachusetts acts pretty much as it does in England.

Examination of stomach contents of 102 Massachusetts birds showed that their food is about the same as that taken by them in England and other European countries. Professor Beal, of the United States Biological Survey, reports that of these specimens, taken mostly in the month of June, 1910, three had eaten earthworms, eighteen, millipeds and spiders, twenty-two, millipeds but no spiders, and eighteen had taken only spiders. The average of millipeds in 22 stomachs was nearly 40 per cent. More than half the birds had eaten caterpillars, forming 45 per cent of the stomach contents. There was also a great variety of other insects in small proportion, most of them injurious to the farming interests. The vegetable content was largely of fruit. The specimens having been taken during the cherry season, most of the birds had eaten largely of that fruit, the stomachs of 18 containing an average of 56.17 per cent of the skins, stones and pulp of cultivated cherries.

Among the bad habits of the Starling in New England, Forbush cites the consumption or destruction of pears, apples, strawberries, lettuce, radishes, wheat and other edibles. The principal spoliation came from a descent of Starlings "in thousands" upon the fruit growers' fields and orchards. The rate of increase and the actual numbers in New England localities invaded by the European Starling have been pretty definitely determined by many observers. Thus, Dr. Edward W. Viator, who has carefully recorded the birds annually seen at Prospect Park, recorded an average of 29 Starlings daily in 1908, 31 in 1909, and 41 in 1910. Mr. John H. Sage of Portland, Connecticut, saw two pairs in that town in 1908; by June, 1910, they had increased to about 100. As for Starlings in the mass, these have been estimated by trained observers to have increased from flocks of 1,000 (in the fall) to 8,000 or, in some instances, to 10,000.

Convincing proof of the enormous increase of the English Starling in America is better furnished by the report of "A Pennsylvania Starling Roost" (*Auk*, vol. 34, 1917, p. 338) made by George MacReynolds. Surely no greater aggregation of these birds has ever been noticed in Europe. Competent observers of this great host, assembled near Doylestown, Pennsylvania, during January and early February, believe that their numbers were at least a million. Their aerial evolutions and chatter were awe-inspiring, and the distant multitude made a noise that was likened to an engine blowing off steam. The excrement of these immense flocks was hauled away in carts and served to fertilize considerable areas.

Reports have been published recently of specimens of *Sturnus vulgaris* from Illinois, Wisconsin, Indiana and neighboring states. For example, H. L. Stoddard (Yearbook of the Milwaukee Museum, 1923, p. 185) describes two males taken in or near Milwaukee during February and March, 1923, dead from the effects of a blizzard. He remarks that this record extends the range of the bird from Port Stanley, Ontario, and Cleveland, Ohio, the nearest points at which it had hitherto been reported. He very properly adds that it is probably only a matter of time before the species will be a common breeder in southern Wisconsin and other localities in the Mississippi Valley.

Harrison F. Lewis (Auk, vol. 39, 1922, p. 513) reports that a pair of these winter-defying birds was found in Labrador in 1917, where they not only raised a summer brood, but flourished in temperatures many degrees below zero. This is probably the earliest Canadian record. Since that year the occurrence of the European Starling has been reported from many parts of Ontario and Quebec. Henry Mousley (Auk, vol. 40, 1923, p. 539) mentions that L. M. Terrill recorded three from St. Lambert, near Montreal, April, 1923; J. H. Fleming, on August 24, 1920, saw a flock of seven near Toronto; and E. M. S. Dale counted seventeen near London, Ontario, in February, 1923.

To the colonization of this hardy bird on the Pacific coast allusion has already been made. Lord (Birds of Oregon and Washington, 1913, p. 239) notes that in the spring of 1901 the European Starling could be seen in Portland, Oregon, nesting in various nooks and crevices of public buildings, apparently in considerable numbers. One might just here raise the question—will *Sturnus vulgaris*, after multiplying, after the usual fashion, due to the favoring climate, limitless nesting opportunities and plentiful food supply of Oregon, follow the somewhat similar example of his species in New Zealand, and, resisting the invading hosts of *Aethiopsar cristatellus* from the north, perchance drive them back on their Canadian lines? It is perhaps an idle query and a profitless speculation. So many things may meantime happen. Moreover, the Crested Mynah may be a better fighter than his New Zealand cousin, *Acridotheres tristis*.

That the European Starling drives certain birds from their nests is too well known to discuss at length. Both at home and abroad all the starlings that form the subject of this sketch prefer nesting places about buildings, in boxes, holes, hollows and crevices of all sorts. This habit brings them in competition with almost every variety of woodpecker, with owls, nuthatches, martins, pigeons, bluebirds, wrens, tree swallows, and many other birds. In the regions occupied by it, the aggressive and sturdy Starling has always had the advantage. He himself excavates no tree. He watches the work under way by a Flicker or other hole-maker and, when the hollow suits his taste, drives away the excavator. As for nesting-boxes, the only way in which the Starling can be prevented from ousting the native tenant is, as Mr. Job shows, to make the entrance-hole less than  $1\frac{2}{3}$  inches in diameter. Naturally, the Starling competes with native birds for their food supply, and, in winter, for instance, this competition may result disastrously, if and when there is a food shortage and the flocks of Starlings become numerous, or the birds have gained an extensive range. In such a contingency it may be expected that the foreign importation will be the last to suffer.

The Massachusetts Report sums up the evidence in a judicial manner when it states that "it is too early yet to say what will be the final result of the introduction of the Starling into this country. Its value as an insect destroyer is plain, but its unchecked increase may prove a calamity to several species of useful native

birds, and from the experience of other countries we may assume that it is likely to become a pest to the fruit grower." Speaking elsewhere of the credit side of this bird's economic ledger, Forbush refers to its usefulness in some parts of Europe because of its partiality for the numerous and destructive land snails. But, he adds, it is not thus beneficial here, because we are not similarly afflicted in this country. He also believes that the Starling can furnish no service in North America that cannot be equally well performed by our own native birds, such as blackbirds, bobolinks, meadowlarks and sparrows, although it may be of use in supplementing the efforts of these and other birds when their numbers are not sufficient to keep in check the insect enemies of our grass lands.

The economic status of the European Starling in this country has been best established by the extensive labors of E. R. Kalmbach and I. N. Gabrielson (Bulletin No. 868, U. S. Dept. Agric., 1921), who not only examined 2157 stomachs of birds, collected throughout their range, but made many observations of them in the field. The authors conclude from their investigations that the food of the Starling is mainly injurious insects, and that, on the whole, it should be classed as a neutral, if not beneficial, introduction. As a supplement to these general conclusions, they add that, although legislation should not prevent the killing of the birds when they are found in the act of destroying crops, they should have general protection. These authors also admit the possibility that the Starling may increase to such an extent that it may eventually become not only a nuisance, but a positive menace; but that time has not yet arrived.

Commenting on this report, the editor of the Auk very pertinently remarks that "the Starling can take care of itself without protective legislation, and that it might be well to leave it in that category, as it is now in most of the states where it occurs. Then, in case of any undesirable development in its habits, its numbers could be checked without waiting for the repeal of a law."

The life history of Australasian importations has proved to be much the same as that of the same birds in the United States. In the center of the city of Auckland, New Zealand, where the English Starling has been long established, I know of at least one nest, built in a chimney that had not been recently used as a smoke carrier. Daily, a pair of birds sat on the top of the ventilator, evidently much at home in the crowded town, disappearing every now and then into the opening below, to reappear as suddenly and mysteriously, as if from nowhere.

Hutton and Drummond (Animals of New Zealand, p. 28) and, more elaborately, G. M. Thomson (Naturalisation of Animals in New Zealand, p. 154, *et seq.*) tell the story of the introduction of several starling species into the Dominion. *Sturnus vulgaris* was imported very early, into Nelson about 1862, into Auckland in 1865, and so on. Their increase throughout the two islands was phenomenal. Correspondents write Mr. Thomson in these terms: "When I arrived from England in 1875, there were only four starlings in the town. They increased rapidly and took possession of the limestone bluffs that look over the bay. After eleven years they were there in hundreds of thousands. Here the bird has few, if any, enemies."

From New Plymouth (in northern New Zealand): "Every evening tens of thousands of starlings perform their cloudlike gyrations around and above the island of Moturoa, which is clearly seen from the hill. Every person who sees them compares them to rapidly moving clouds." As elsewhere, opinion is divided in New Zealand on the economic value of the alien European Starling. Thomson believes it to be, so far, beneficial. He says that the effects on the insect life of the country by Starlings, and through them on the vegetable and other animal life, is incalculable.



They have nearly destroyed the grasshoppers, formerly so abundant; and many other groups of insects must have suffered. They remove great quantities of ticks from sheep and cattle, and help to keep insect pests from them: Surely, high praise from such an eminent authority. But he modifies this otherwise clean bill of health by adding that "indirectly they are credited by many observers with having exterminated pheasants, partridges, introduced quail, wild turkeys, wild fowls, etc., from many districts, by having eaten out the insect food, so that these larger birds are now unable to rear their young broods. In many places they are accused of being fruit-stealers, attacking not only small fruits, but also pears, plums, and peaches."

Thomson (*loc. cit.*) says of this bird in Australia that in many parts of New South Wales cherry growing has become impossible owing to the persistent attacks of the introduced European Starling. *Sturnus vulgaris* has been placed as no. 382A on the R. A. O. U. list. It is there noted (Leach, Australian Bird Book, 1923, p. 186) as an introduced, nomadic species, very common throughout its unrestricted range—the open country. Its food is a composite of insects, caterpillars, and fruit.

*Acridotheres tristis*. Common Mynah. House Mynah. This is probably the second-best known species, transplanted during the last fifty years from India to many lands outside its normal range. Among the many observers that have studied this bird at home is Douglas Dewar (Birds of the Indian Hills, 1915, p. 60), who says that it is nearly as abundant in the hills as it is in the plains. "This bird is considerably smaller than the Crow. His head, neck and upper breast are black, while the rest of his plumage is quaker-brown, save for a broad, white wing-bar, very conspicuous during flight, and some white in his tail. The legs and bill look as if they had been dipped in the mustard pot, and there is a bare patch of mustard-colored skin on either side of the head.

"This sprightly bird is socially inclined. Grasshoppers form its favourite food. These it seeks on the grass, over which it struts with as much dignity as a stout raja. In the spring the Mynahs make free with our bungalows, seizing on any convenient holes or ledges as sites for their nests. The nest is a conglomeration of straw, rags, paper, and any rubbish that comes to beak. The eggs are a beautiful blue."

The only other Mynah commonly seen in the Himalayas, according to Dewar, is the Jungle Mynah (*Aethiopsar fuscus*). It closely resembles *Acridotheres tristis*, but careful inspection reveals a little tuft of feathers on the forehead, which is lacking in the latter. Moreover the yellowish patch of skin about the eyes is not seen in the Jungle Mynah.

Jerdon (Birds of India, Assam and Burma, p. 325), points out that the adjective *tristis* refers not at all to the disposition of the lively Common Mynah, but to its sad-colored plumage. He adds to the usual description of this Starling that there are irregular, whitish dots on the red-brown irides, that the average length is 10 inches; wing 5.25; tail 3.5. He remarks that they are noisy birds, and early in the morning and evening seek a particular tree, where they may collect in hundreds, keeping up a continual, though occasionally interrupted, chatter.

This latter habit is not, of course, confined to the starling genera, although it is with them a common incident. I well remember several of these "Mynah trees" on Viti Levu, Fiji Islands, where the noisy birds made themselves quite obnoxious to certain neighborhoods. In one locality a large and spreading wild fig was a favorite roosting resort for several hundred Mynahs. About sundown they flew from every point of the compass and before settling for the night gave the near-by citizens the benefit of a concert that could be heard a quarter of a mile away. I often was an interested audience, and did not dislike the alternate rise and fall of so many avian

voices. Whether this musical display would have appealed to me were it repeated outside my bedroom window every evening as well as each morning just before sunrise is a question I cannot answer.

The citizens living in the immediate vicinity of this particular Mynah tree, however, decided they had stood it long enough, for one evening when I happened along to hear the sunset orchestra, there was silence in the trees. On inquiry I found that firearms and other offensive agents had been brought into play with the result that the birds chose another resting place some 500 yards distant, where they were not further molested during the remainder of my stay in Fiji.

Returning to Jerdon's account, he noticed that shortly after sunrise the Mynahs disperse in small parties, and, in the breeding season, fly off to their nesting grounds. Some of them remain about the houses and native huts, picking up rice, fragments of bread, etc., even coming indoors in search of food. Still others, with cowbird-like propensities, attend flocks of sheep and herds of cattle, generally for the purpose of catching the grasshoppers and other insects disturbed by these animals as they slowly move about cropping the herbage. Some of the birds perch on a cow's back, and, it may be, take useful toll of the bovine parasites; but I have never seen them actually do this, although it is a common experience to see one or more Mynahs perch on the backs of cattle in the Fijis and elsewhere. A companion of mine was so struck with this habit that she suggested the phrase "To every cow her Mynah!" The odd pedestrian habits of this bird did not escape the notice of Jerdon. Certainly he is a graceful and rapid walker, nodding his head as he struts across lawn or highway and assisting progress by occasional hops. He is also a straight and quick flyer. His call-notes, apart from his matin and evensong, are of great variety, some of them not unmusical, especially when, in his capacity of mimic, he has learned the notes of a better songster.

In India all the Mynahs are commonly kept as cage birds. They are easily tamed and domesticated, and may even be taught to follow some member of the household about like a dog or a cat. Although not as good a talker as some others of the Sturnidæ, the Hill Mynah for example, the Common Mynah is a good mimic, and often picks up words and even short sentences. Jerdon is authority for the statement that this bird was introduced into Mauritius to destroy the grasshoppers, and is now perfectly naturalized in that colony. He is sacred to Ram Deo, and is the bird that is represented as perching on the arm of that deity.

Hume (*Nests and Eggs of Indian Birds*, 1890, vol. 1, p. 377) tells us that a pair of Common Mynahs bred yearly in the roof of his verandah at Simla, at an elevation of 7,000 feet. They are very domestic birds and greatly affect the habitations of man and their immediate neighborhood. They build in roofs of houses, in holes in walls, and in the earthen chatties that in some parts the natives hang out for their use, as the Americans hang boxes for the Purple Martin. Very rarely do they nest on the branches of trees. The nest itself forms a shapeless but warm lining to the hole, and is composed chiefly of straw and feathers in which fine bits of cotton, strips of rag, shreds of old rope, dried snake skin and all sorts of odds and ends may be incorporated. I well remember watching the construction of one of these nests during the month of September in Suva, Fiji. It was built in an air-space of our hotel verandah, and the most miscellaneous collection of material was gathered by the birds. One of the favorite articles was the lining of a straw mattress that they had discovered and pulled out of its covering. Pieces of twine, excelsior and paper were also carried into the nesting hole.



According to Hume, the normal breeding season of the common Mynah in India lasts from June to August; but on Ross Island, in the Andamans, where they were introduced about 1880, they seem to breed all the year round. Hume thinks this abnormal prolificness may be due to the uniformly warm temperature of these islands and the great heat of the sun at all seasons, rendering much incubation unnecessary. Even on the plains of northern India, and in the hot weather, when the Mynahs breed, they do not "sit close," and since in the Andamans the days and nights are so constantly hot the eggs can almost hatch by themselves. This may be partly the reason why the birds raise more broods annually than they do on the mainland. The eggs are spotless, glossy, sky-blue or greenish-blue, are rather long, oval or pear-shaped. Four or five eggs are generally found.

I have had personal experience of and have studied *A. tristis* in Tahiti, Rarotonga, New Zealand, Fiji and Hawaii. So far as I could learn, the habits of the bird are about the same in all these lands. The rate of increase varies a little, but where food and human habitations are plentiful there the Mynah flourishes. Bird life on the Society Islands is not very noticeable, but, such as it is, to the casual observer the wayside avifauna seems to consist almost entirely of introduced starlings and pigeons. This is not so true of Suva and the other towns on Viti Levu, Vanua Levu and Ovalau of the Fiji group, but there they are also much in evidence. It was a relief to visit such islands as Kandavu and Bega, that were free of the pest. In all the countries mentioned, the House Mynah was imported in the hope that it would help to eradicate noxious insects, and especially those inimical to the planter's interest. So far as I could learn, it gained its first foothold in Fiji about 1880.

During my stay of six months in Fiji I had ample opportunity to observe and study the Common Mynah and, at the request of the Government, made a report on its (probable) economic status. From this report I quote briefly: That a bird may be included in the list of "animals useful to agriculturalists" it is generally necessary to decide not only its attitude towards the planter's or gardener's products, but also the influence it exerts upon the friends and enemies of these forms of plant life. I have not examined the stomachs of many Mynahs, but in the digestive tract of those I have shot I have invariably found, in areas where Köster's curse (an introduced Brazilian plant) was at all plentiful, the seeds and soft parts of that pest, the former unaffected by the intestinal juices. Moreover, I found very few insects in the stomach. This evidence, so far as it goes, shows that in certain localities at least, the Mynah is a disseminator of noxious weeds and a very poor exterminator of (possibly) harmful insects. I would, consequently, strongly urge that the stomach contents of, say, ten of these birds be carefully explored, after their morning meal, in twenty typical localities, to settle this question more definitely. I believe that birds taken in the immediate vicinity of five copra and five sugar plantations, as well as in and about ten paddocks infested by lantana, Köster's curse and other plant pests, in widely separated localities, would do more than any other plan to decide whether the Common Mynah is the planter's friend or his enemy, whether it is inimical in certain environments and, possibly, of economic value under other and different surroundings. Such a test would do more to furnish essential information than any amount of evidence based on mere opinion or casual observation of the habits of these birds. As to the influence exerted by the Mynah on the native bird life of the Colony, it is, I am convinced, distinctly deleterious. There is no doubt but that the smaller birds are forced out of, and driven away from, many localities by the advancing hordes of this resourceful, highly intelligent and pugnacious intruder. I have often seen the Mynah chasing small birds and engaged in encounters with larger ones, including

pigeons, doves, honeyeaters, etc. The harm arising in this way affects seriously the good work of the very useful insectivorous birds, such as the Silver Eye, the Thick-heads, the Fijian "Robin", the Fantails and other insect eaters, upon whose helpful aid the agriculturalist must rely to hold in check the multitude of his entomological enemies. From this standpoint alone the Mynah is a menace to colonial agricultural interests. Birds thus disturbed and harried are not only limited in their nesting and reproductive functions, but they are very likely to desert those areas where they are most needed and in which they normally thrive.

The continual increase of the Mynah in Fiji is a matter of importance. Even if the bird is not an evil now and in his present numbers, it may become one by large accessions to the ranks, as has been the case in other countries. At least until a definite policy, as the result of scientific investigation, has been adopted the Mynah should be denied entry to those islands, Kandavu for example, to which, as I think happily, it has not yet gained admission.

Dayton Stoner (Auk, vol. 40, 1923, p. 328) has also studied this bird around Suva. He found that the hope that *tristis* would control noxious insects has not been realized. Other food has been more easily secured; native birds are to some extent molested and their numbers more or less held in check by this thrifty, pugnacious bird. Also, the habitations of the people are not improved by the building of nests in their chimneys, eaves, spouts, etc., and by the defilement that follows.

Stoner has noted an interesting fact about the Fiji Mynah that may have an important bearing on the numbers of this bird. He discovered on a Mynah taken on June 19, 1922, a number of parasites. These Dr. Ransom, of the U. S. Bureau of Animal Industry, recognized as worms of a new species. They were extracted from between the cornea and conjunctiva; others, flies and lice, with eggs of the latter, were also found on the body of the same bird. A number of Mynahs of the same series were shown to be similarly infested. Should the Mynahs be attacked by these enemies to any considerable extent it may seriously retard their increase.

Bahr (Bull. Brit. Ornith. Club, no. 171, 1911, p. 102; see also his paper in the Ibis on the Birds of Fiji) remarks that the Mynahs "have increased to an alarming extent. They were introduced to rid the sugarcane of several insect pests, but so far have been mainly instrumental in driving away native birds."

It is a curious fact that Brisson (Ornithologie, II, p. 278, 1760; accepted by Bowdler Sharpe, Cat. Birds Brit. Mus., XIII, p. 80), under the synonym *La Merle des Philippines*, describes this Mynah, thus giving color to the belief that it was a very early introduction into our Far Eastern islands.

Edward Newton (Ibis, 1861, p. 115) sent home several skins of *A. tristis* from Mauritius, labeling them as introduced from India. Elsewhere (*loc. cit.*, p. 273) he says they are universally distributed throughout the island, and that thousands roost, for example, in a grove of trees by the Mer St. Martin, chattering and screaming in their well known fashion.

Dr. J. A. Leach (An Australian Bird Book, 1923, p. 187) gives the introduced common Mynah a place in the R. A. O. U. list as no. 382B, and notes it as very common and non-migratory throughout Australia, where its food is, as elsewhere, mixed insects and fruit; its preference is for urban life.

The Common Mynah was introduced (Thomson, *loc. cit.*) into New Zealand in the early seventies. One of the most remarkable facts in its history is the increase of the birds after their first importation, and then their subsequent diminution and, in some localities (the southern towns, for example), their eventual disappearance. The last incident seems to be due to the invasion of these districts by their cousins, the

European Starlings, the increase of the latter keeping pace with the decrease of the former. F. W. Hutton, writing 1890, says: "A few used to be seen about Christ Church, but they have disappeared before the starlings." Opinion as to the economic value of this Mynah in New Zealand is divided. For instance, the Agriculture Inspector for New Plymouth in 1903 blamed the bird as the chief cause for the spread of the blackberry, an introduced pest in the Dominion; but Thomson regards this as an error, because the House Mynah is in New Zealand mainly insectivorous and not to any extent a fruit-eater, and it is almost confined to towns.

On the other hand, Drummond, a most competent authority, says, in May, 1910, that they are very destructive of apricots, apples, pears, strawberries and gooseberries. Still another witness has seen a dozen Mynahs follow the plough all day unweariedly, picking up an abundance of grubs.

Just here it may be proper to say that the Australian Mynahs (also introduced into New Zealand) of which there are at least five species, of the genera *Manorhina* and *Myzantha*, are not starlings at all, and do not come within the purview of this paper. On the other hand, some of the Dominion importations of Indian Mynah did reach New Zealand by way of Australia.

O. Finsch (Ibis, 1882, p. 390) saw several years before this date *A. tristis* well established in Wellington and Wanganui, New Zealand. He also noticed the English Starling as a common bird in Dunedin and Christ Church.

McGregor (Condor, iv, 1902, p. 60) found *A. tristis* well established in Hawaii in 1900. It was extremely abundant at that date on Maui Island. Bryan (Auk, vol. 18, 1901, p. 387) says the Common Mynah has an unenviable reputation in the Hawaiian Islands, that it was introduced by Dr. Hillebrand, and that experiments were under way to establish more nearly the exact relation of the Mynah to his friends and foes.

The account given by H. W. Henshaw (Birds of the Hawaiian Islands, 1902, p. 129), so far as I could learn during a recent visit to Hawaii, accurately describes avian conditions at the present time. He says that *A. tristis* is widespread over the islands, and there is no doubt that the bird is constantly increasing in numbers. Notwithstanding that the Mynah destroys vast numbers of insects and in this way is of direct and great value in the cane-fields, in the pastures, and among cattle, there is a strong and growing prejudice against the bird. The charge is made that the Mynah invades the cote of the domestic pigeon, and even ejects the eggs and young birds. "That the Mynah sometimes dispossesses the pigeon of its home there is no doubt, although, on the other hand, it not rarely shares a portion of the cote with the proper owners, and seems to rear its young on not unfriendly terms with them. The object of the Mynah is not direct injury to the pigeons—for apparently it eats neither their eggs nor their young—but is solely to find a safe refuge for its own eggs, the Mynah being partial to boxes and to cavities in trees in which to nest." Henshaw does not believe that this habit of the interloper is important, as the alien can easily be expelled from dove-cotes. A more serious charge against this Mynah is that he eats and otherwise destroys figs and small fruits; also that he fights with, and drives away, native birds. It is perfectly true that all native Hawaiian birds are diminishing greatly in numbers and there is a widespread belief that the House Mynah is largely responsible for this decrease.

With certain reservations, Henshaw believes that *tristis* is a beneficial species. But, he says, "even a species which is in the main beneficial may increase to such an extent as to be a nuisance, and such seems likely to be the case with the Mynah. Its numbers, even at present, are startling, and there seems to be no limit to the possibil-

ities of its increase. Any altitude, high or low, is suited to its tastes. It is true that the bird shuns the dense forest, but in tracts where the undergrowth has been somewhat thinned by cattle it is entirely at home, no matter how far from civilization." Although the writer tries to take an optimistic view of the Mynah's presence in the Territory, he believes it has come to stay, and that so wary and resourceful a bird is not likely to be seriously reduced in numbers by traps, guns or poison. It may be possible to check the increase by a liberal expenditure of money, but anything approaching extermination is practically impossible.

*Aethiopsar cristatellus*. The Crested Mynah. This starling exhibits characters that readily distinguish it from other birds even at a distance, and that serve as points of definite recognition by the most superficial observer. They are chiefly the stocky build of this robin-sized bird, whose glossy-black plumage is in striking contrast with a large, white, marginal *wing-patch*, fairly well marked above, but seen still more plainly beneath; hence more *conspicuous during flight* than when the bird is perching and with folded wings. Added to this peculiarity is his yellowish-white bill, overhung by a *fanlike crest* which is placed entirely in front of the eyes and so far forwards on the upper mandible that it conceals the nostrils. There is no other bird along the Pacific Coast that resembles this Mynah, nor any that carries similar conspicuous markings. The fact of ready recognition will, doubtless, prove of practical advantage in dealing with the bird in future should it greatly increase in numbers or invade distant areas. The bird's original habitat is central and southern China. (For portrait, see frontispiece to this article, fig. 41.)

Nearly all members of the Starling family have acquired a good reputation as cage-birds. Among writers on the subject A. G. Butler (*Foreign Birds for Cage and Aviary*, vol. 2, p. 34), gives one of the best accounts of these intelligent animals. The misleading vulgar synonym, "Japanese" Starling, derived from the fact that the bird is imported into Japan and sold there as a domestic pet. It is, indeed, not impossible that it was by way of Yokohama that *A. cristatellus* was brought into Vancouver. Russ, speaking of early importations into Germany, says that it is one of the most charming starlings in the trade, although it is uncertain and easily excited. He also says that the species was successfully bred as a captive in 1875.

Richard C. McGregor (*Some Features of the Philippine Ornis*, 1920, p. 364) gives an account of the introduction of this bird into the Islands. He says that for several years there was a roost of these Starlings in the trees in front of the Luneta police station, on Bagumbayan Drive, where their chatter was very noticeable at night. He remarks that this bird appears to have been introduced by the Spanish Government about 1850 with the hope that it would reduce the number of locusts, which were and are still a very serious pest to the agriculturist. He adds that Blair and Robertson (*The Philippine Islands 1493-1898*, 1907, p. 127) say that at least three attempts were made by the Spanish Government between 1849 and 1852 to introduce and establish a species of *martin*, probably one of the starlings, into the Islands for the purpose mentioned. McGregor believes that the introduced bird does eat some locusts, but it has not increased in numbers sufficiently to have been of much use in alleviating the pest. Meantime the Starling has spread to towns in the vicinity of Manila; it has also reached towns about Lake Bay, and it was noted at Tagudin, Ilocos Sur, in 1909. At this date it has been recorded only on Luzon.

R. Swinhoe (*Ibis*, 1863, p. 382) gives a graphic account of this bird in the level country of Formosa, and reports that it is identical with the Chinese species. It ranges over the island the whole year.

For the purpose of gathering information of a definite character regarding the introduction and subsequent career of the Chinese Starling on the Pacific Coast of North America, I sent a brief questionnaire to the following gentlemen, whose experience as naturalists and long residence in British Columbia distinguish them as authorities on the subject: Mr. F. Kermode, Director of the Provincial Museum; Mr. J. A. Munro, Chief Federal Migratory Bird Officer for the Western Provinces; Major Allan Brooks, Okanagan Landing; Mr. F. R. Butler, Secretary of the Game Conservation Board; Mr. Fred G. Crickmay, Vancouver, and Mr. R. A. Cumming, South Vancouver. Mr. Kermode (Report of the Provincial Museum, 1920, p. 20) and Mr. Munro (Canadian Field-Naturalist, 1922, p. 32) have both written interesting accounts of this bird. Without attempting to tabulate (and thus repeat) the information furnished by these gentlemen, I shall give the consensus of opinion.

The earliest date given for the introduction of the species is 1897, when two pairs were seen. Major Allan Brooks writes me that he first saw this bird in British Columbia some time during 1903, when it was very scarce. It was certainly unknown as early as 1894. Replying to the question as to whether the Crested Mynah molests or displaces birds native to British Columbia, Mr. Kermode voices the unanimous opinion of my informants when he writes: "From personal observation, I find that the Japanese Starling has been a great offender in taking the nesting sites of some of our valuable insectivorous birds, and during the last few years it has been noted, especially in the vicinity of Vancouver, that many of these birds have deserted their old haunts or nesting places, now occupied by Starlings. This is particularly true of the woodpeckers and wrens. In the case of the wren, they first oust the occupant and then enlarge the nesting hole."

In Vancouver, as elsewhere, this Mynah builds its nest in almost any kind of hole or crevice, whether made by other birds or not, in houses or barns, in telephone poles, cavities in trees, etc. All the observers are unanimous in reporting a steady and marked increase in the total numbers and flocks of this bird. Mr. Cumming estimates their present numbers at between 6000 and 7000 in Vancouver alone.

To this date, *A. cristatellus* is confined to an area roughly circular in form, with a radius of about 50 miles from the Vancouver waterfront. This enlargement of its range, Cumming says, represents an advance of about a mile a year in the past sixteen years. The principal roosts are still in the center of the city; others, scattered about the suburbs and adjacent rural districts, shelter a relatively small number of birds. Lulu and Sea islands, as well as the municipality of Point Grey, have acquired additional colonies. Munro mentions the more distant New Westminster as at present the farthest outpost of the advancing host.

The food of the Chinese Starling in British Columbia is apparently of the same character as that eaten by the same bird in cities and rural localities in other parts of the world. In the town proper they act as scavengers and devour all sorts of refuse foodstuffs. When possible, they eat loganberries, raspberries, pears and cherries, especially the last. In 1911 Major Brooks watched a tree being stripped of its crop of cherries, a stream of Mynahs coming and going to and from their nests carrying the fruit to their young. Messrs. Munro and Crickmay do not believe there is any evidence so far adduced that *cristatellus* will eat the tent-caterpillar, so destructive to British Columbia plant life. It is felt that if he would imitate the small "Tom-tit" in this particular all his sins of omission would be overlooked and his increasing numbers gladly encouraged. Munro has made an examination of the stomachs of ten Starlings taken during the month of June, when the tent-caterpillar plague is at its height, but found no evidence that any of these noxious insects had



been eaten. Of course, as he points out, this material is entirely too small to base any reliable conclusions upon, but it does stand as an indication of the sort of food one group of these birds mostly eats. In all the stomachs vegetable matter was in excess of animal. The former included unidentified fruit pulp, raspberry and service-berry seeds, oat husks and leaf fragments, while the latter consisted of spiders and several insects, among them house flies, a milliped, and larvae of various kinds. Munro also points out that there are over 130 insect and weed-seed destroying birds within the boundaries of the Province, so that on that score alone there does not appear to be a place for a bird of such doubtful reputation as the Crested Mynah.

I cannot discover any record of disease or parasitic enemy of *crisatellus* that might check his undue increase and spread along the Pacific Coast; indeed all the factors of adequate food supply, climatic conditions, nesting opportunities and freedom from natural enemies combine to insure his steady march both inland and along the ocean front.

The query "Do you regard the introduced starling as a useful acquisition?" was almost uniformly answered in the negative. Mr. Butler, however, thinks that "the starling is in some instances a useful bird, but only in respect of its insectivorous and refuse diet." To this statement he joins the proviso that he regards the stealing of the nests and eggs of native birds as outweighing even these advantages. Ker mode reports that W. B. Anderson, Dominion Inspector of Indian Orchards, has authentic records from two observers who saw Chinese Starlings destroying tent-caterpillars. All of which points to the necessity of making during the year fairly frequent examinations of a sufficiently large number of Mynah intestinal tracts properly to settle the debated food question. As an indication of what one might find (in winter) in the stomachs of a few urban specimens, Mr. Cumming, at the request of Dr. Grinnell, took and sent to the Museum of Vertebrate Zoology eight birds for inspection. These were all shot between 8 and 9 P. M., March 2, 1924, in the neighborhood of the market gardens of Vancouver. Dr. H. C. Bryant has been good enough to examine the stomach contents for me, with the following results:

M.V.Z. No.	Sex	State of stomach	Contents	Per cent of animal matter	Per cent of vegetable matter	Sand and gravel
44477	♀	Full	5 oat kernels and hulls 1 caterpillar	5	95	0
44478	♂	Half full	Oat hulls and green vegetable debris	0	100	0
44479	♀	Nearly empty	Unidentified green vegetable matter; buds (?)	0	100	0
44480	♀	Three-fourths empty	Oat hulls and green vegetation not identified; sand or fine gravel	0	95	5
44481	♂	One-third full	Seeds and seed hulls; one small earth-worm	20	80	0
44482	♂	Empty	.....	.....	.....	.....
44483	♀	Nearly empty	Vegetable matter, 60%; two small, dry stems, 40%	0	100	0
.....	♂	Full	5 oat kernels and hulls, 98% green vegetable matter, 2%	0	100	0

It is desirable that a similar examination of the gullet, stomach and duodenal contents be made every two months during the year, so that a more satisfactory opinion may be given and more definite evidence furnished as to the annual food intake of the Vancouver colony.

As it is important to learn whether *crisatellus* has recently reached our Pacific States, and especially those bordering on Canadian soil, I wrote to several ornithologists in Oregon and Washington. Stanley G. Jewett was the only one who had definite knowledge of such introduction. Under date of March 24, 1924, he writes me from Portland, Oregon, as follows: "I have one record of the occurrence of the so-called Japanese Starling this side of Vancouver, B. C. On February 4, 1922, one of these birds made its appearance at a residence in East Portland, when several interested bird students also saw it. I got permission from the Police Department to shoot the bird, but had to leave town for a few days and on my return the Mynah had disappeared." In this connection it must always be remembered that a solitary appearance of this bird, especially in localities much removed from its ordinary habitat, may result from the escape of a captive. It is a favorite cage-bird among our Japanese and Chinese inhabitants, and is occasionally found in our bird stores.

*Conclusions.* From the foregoing study of the Starling in general and of *Aethiopsar cristatellus* in particular, one may arrive at certain conclusions as to the present activities and probable future of the colonies planted in this country.

(1) The habits of all the expatriated Sturnidae are, under somewhat similar environment, everywhere the same. They are all omnivorous. Insects of several species (some of them noxious), a few varieties of obnoxious weed-seeds, city garbage, cultivated fruits—these form the ordinary diet of the introduced species.

(2) The chief objections urged against these alien birds are their driving away and displacing valuable native birds and their destruction of garden fruits—berries, cherries, pears and other products of the orchard. When they have increased to such an extent that they form large flocks they invade gardens in the fruiting season and strip the trees and vines.

(3) The Crested Mynah has gained a firm foothold in Vancouver and vicinity, and has come to stay. It is rapidly extending its range and increasing its numbers; the latter are variously estimated at from 5000 to 7000, the descendants of a few pairs liberated less than 25 years ago.

(4) In British Columbia it has behaved much like the European Starling in New York State and in New England, under some influences devouring hurtful insects and deleterious weed-seeds, under others destroying important fruits, especially devastating cherry and similar crops.

(5) Examination of the stomach content of the imported Crested Mynah, although not as yet thoroughly carried out, indicates much the same finding as in the case of the Atlantic Coast Starling.

(6) *Aethiopsar cristatellus* drives off native British Columbian birds, and of those that breed in holes and crevices confiscates their nests and destroys eggs and young.

(7) Owing to the large supply of useful and efficient native insectivorous birds in British Columbia and the Pacific States it does not appear likely there is or will be an economic place for a bird that is only in part a destroyer of noxious insects. Moreover, any considerable displacement of purely insectivorous birds by an omnivorous species is rarely advisable, since the latter often abandons an insect diet for the preferable or more easily obtained fruit foods.

(8) So far as known, *A. cristatellus* has on the Pacific Coast no enemies or other agent likely to check its spread or limit its numbers. One may confidently expect that in the course of time this prolific and resourceful bird will breed in hundreds of thousands and literally occupy the land. It will, then, as other Sturnidae

have done under similar conditions, become a pest, not only taking the place properly belonging to more useful birds, but will, at seed-time and harvest, descend upon orchard and field in devouring myriads.

(9) If careful examination and field observation during the next year or so confirm these prognostications, the Chinese Starling should be actively and effectively dealt with ere it is too late, that is, before countless numbers and a wide range render effective action impossible.

(10) The possible extermination of this species on the Pacific Coast would be greatly assisted by the fact that it has markings (peculiar crest, wing-spots, etc.) that readily distinguish it from any native birds.

*Berkeley, California, March 31, 1924.*

### BANDING WHITE PELICANS

(WITH MAP)

By HENRY B. WARD

(Contributions from the Zoological Laboratory of the University of Illinois, No. 238)

CONCERNING one of the most interesting and peculiar North American birds, the White Pelican (*Pelecanus erythrorhynchos*), relatively little is definitely known of the routes taken by individual groups in migrating from the breeding grounds to the winter feeding grounds. In winter it occurs abundantly along the western shore of the Gulf, both in the United States and in Mexico, along the Pacific Coast of Mexico and part of Southern California, and infrequently in the interior of Mexico.

The breeding grounds are nearly all north of the fortieth parallel and all of them west of the Great Lakes. Due to the encroachments of man many of the smaller breeding places listed by A. C. Bent (Bull. 121, U. S. Nat. Mus., 1922) have been broken up and the large colonies remaining are in Canada or the northwestern United States. Only two breeding grounds are concerned in this paper, one on Yellowstone Lake, Wyoming, the other at or near Reed Lake, in the vicinity of Morse, south-central Saskatchewan, from which a single record will be given first.

On September 30, 1921, a tame pelican, then about six months old, was banded at Morse, Saskatchewan. Although allowed entire freedom it remained at the place of banding until October 22, when it was observed to fly south. Five days later (October 27) it was reported from Lindsay, South Dakota, where its tameness made its capture a simple matter. In reporting the "return" Mr. Ray Norman stated that he had added his own name and address to the band and again released the bird. It has not been heard from since. Reference to the map will show that this bird (no. 100,553) was apparently following the general course of the Missouri River, as Lindsay, although on the Cheyenne River, is but a few miles west of the larger stream. These data are admittedly of a fragmentary nature but they point to the use of a definite and well-known migrational highway for the white pelicans noted in the fall on the streams and lakes of the great plains; these birds come probably from the breeding grounds of the north-central United States and south-central Canada.

In connection with some studies on the pelican at Yellowstone Lake, made under the joint auspices of the United States Bureau of Fisheries and the National Park Service, I had an opportunity to band some of the young birds in July, 1922. I am greatly indebted both to the United States Commissioner of Fisheries and the Superintendent of Yellowstone Park as well as to many others connected with both services for assistance without which my work could not have been carried out.



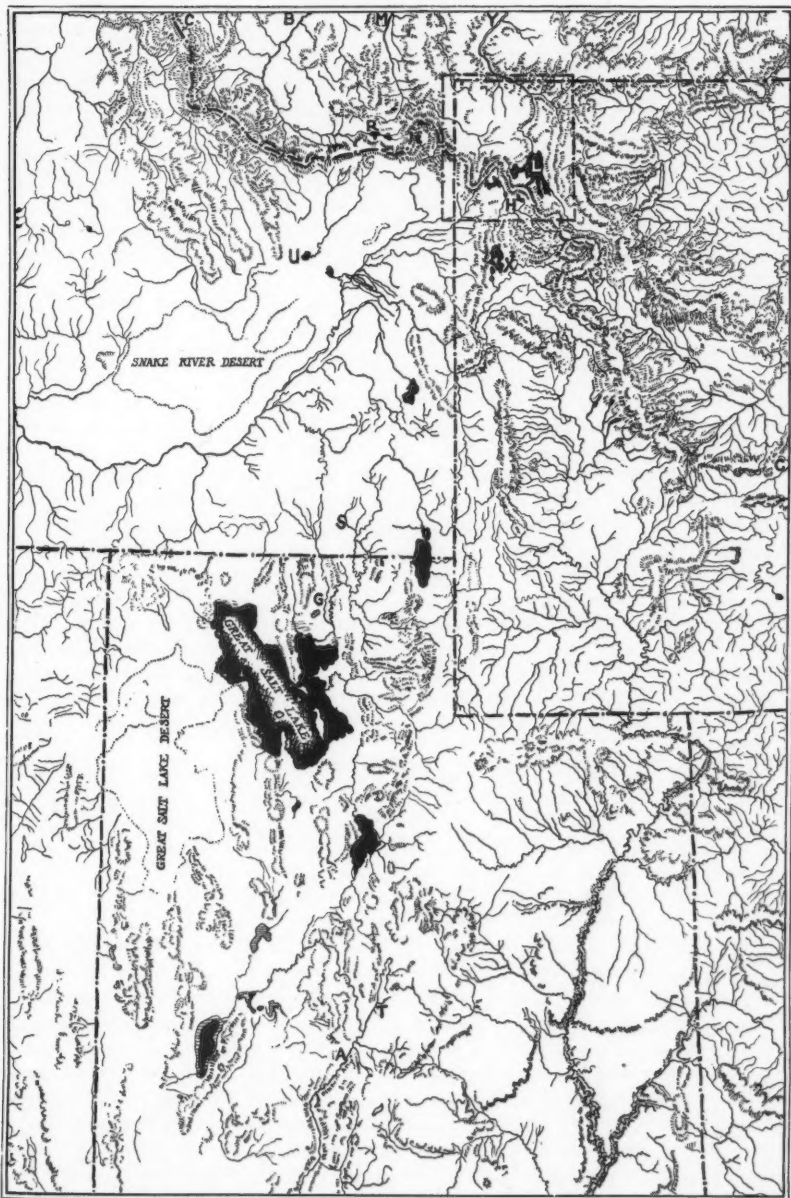


Fig. 42. MAP OF PARTS OF WYOMING, IDAHO, MONTANA AND UTAH, SHOWING MIGRATION ROUTES OF PELICAN AS INDICATED BY RECORDS OF BANDS RETURNED. ONLY THE PROMINENT MOUNTAIN RANGES AND RIVERS OR LAKES ARE INDICATED. LETTERS REFER TO THE FOLLOWING POINTS:

A, Aurora on Sevier River, Utah; B, Beaverhead, Jefferson River, Montana; C-C, Continental Divide; G, Garland on Bear River, Utah; H, Heart, Lewis and Shoshone Lakes; L, Yellowstone Lake; M, Madison River, Montana; R, Red Rock Lake, southwest Montana; S, Swan Lake, Bannock County, Idaho; T, Sterling near Sevier River, on San Pitch River, Utah; U, Mud Lake, Jefferson County, Idaho; Y, Yellowstone River, Montana; X, Jackson's Lake, northwest Wyoming.

We visited several times the low island on which the birds breed and made notes on the habits and growth of the young which were hatched about June 25 to 30. On July 26 the young were already pretty well grown; even a week earlier when we visited the island we found that the old birds had all gone for the day, leaving only the young in the nests. When we neared the shore, some 40 out of the 225 were already in the water and others took to it as we approached the group. The young birds were still covered with down and were not vigorous swimmers, although they rested easily on the water and made fair progress even though it was for a few strokes only. On all subsequent visits they rushed to the water immediately on our approach and it was necessary to head off the groups in order to prevent them from escaping us.

On July 26 we herded them into a large net and put metal bands on the feet of 75 of the largest and strongest. The young birds on the island at this date numbered approximately 200; black wing feathers were just beginning to be evident. On land the young were exceedingly active; they stood erect firmly and ran rapidly; when cornered they began to fight aggressively, striking boldly at their visitors and evidently trying to reach our faces in their thrusts. These actions were in rather marked contrast with those manifested on earlier visits.

The birds that had been banded were carefully inspected on subsequent visits and particular search made for any that might have died between times. Among the small birds found dead on the island later than the date of banding there were only four that carried bands, so that approximately 70 birds must have left the island in the fall flight carrying the bands with them. These bands were of the type furnished by the U. S. Biological Survey. All in all, there have been returned to us, through the Biological Survey, records of seven of the birds that were banded. One of them was reported from a point almost directly west of Yellowstone Lake, no. 201,820, having been found dead at Red Rock Lake, Montana, late in September (exact date not given). No. 201,850 was found at Mud Lake, 40 miles northwest of Idaho Falls, Idaho, on October 1, and no. 201,815 came from Swan Lake, Idaho, on October 23.

One bird, no. 201,835, was taken at Bear River near Garland, Utah, about October 5, one, no. 201,860, at Sterling, Utah, October 11, and a third, no. 201,873, on the Sevier River near Aurora, Utah, about October 10. These all seem to have been members of a group moving almost directly south from Red Rock Lake through the great central valley of Utah and were headed apparently towards the Gulf of California or the coast of Lower California, although it is possible that all or part may have later turned southeast towards the Gulf of Mexico.

From the Lake Ranger Service I obtained definite information that the birds had begun to leave the Lake by September 10, and the last had gone by September 25. The breeding grounds on Molly's Island were divided very distinctly between different groups of birds which had arrived at different times and had young of different ages. In one group of 30 nests all the eggs had hatched before our first visit (June 26) though the young were apparently only a few days old. In another group only a small part of the eggs were laid at that date and a third group of nests contained eggs well advanced in incubation. While these groups of nests were continuous in places, like tangential circles or ovals, yet one could readily separate them at a glance. Now one might naturally infer that they represented separate flocks of birds that, arriving at different times, had come from different places or had followed different routes. And yet an examination of the records furnished by the bands returned gives little support to such a view. A brief description of the localities and the region will show some interesting features concerning the migration route.

Yellowstone Lake lies east of the Continental Divide and all the records of the pelicans banded there show that, possibly excepting the first one reported, the birds had crossed that range into the basin west of it. One might perhaps expect them to turn south without crossing the Divide and yet the actual conditions at this point show that their action is not as strange as may appear at first. Yellowstone Lake lies just east of the Divide which here is a broadly rounded ridge without marked summits. Adult birds from the nesting places were often observed during the breeding season to rise from the Lake and cross the Divide apparently for the purpose of obtaining food, and pelicans undoubtedly from this colony were observed fishing on lakes southwest of the Divide at the headwaters of the Snake River. A southerly or southwesterly course, east of the Continental Divide, would carry the birds through a very rugged country, with no feeding or even resting places within considerable distance. If any migration route were to be followed east of the Continental Divide, a more natural course would seem to be by the Yellowstone River first northward and then eastward, following the streams of the Missouri drainage into and along the valley of that river.

On the other hand the passes of the Continental Divide for some distance beyond Yellowstone Lake are low and small lakes are numerous. Near here, for instance, is Two Ocean Pass in which it will be recalled Jordan located the ancient transmigration of the trout from Pacific streams into waters of the Atlantic drainage. Once having crossed the Divide the pelicans would find an abundance of marshes, lakes and streams in a continuous series down river valleys into Great Salt Lake and beyond into southern Utah. These would give frequent and needed resting and feeding grounds for the young birds which in their first migratory flight could hardly cover large distances continuously.

Yellowstone Lake is 7741 feet above sea level and the summit of the Continental Divide, which lies only 5 miles straight west from Molly's Island and barely 2 miles from the south arm of the lake, is about 300 feet higher than the water level. Just over the Divide lie Heart, Lewis and Shoshone lakes, from 7100 to 7500 feet above sea level and no one of them more than 5 to 7 miles distant from Yellowstone Lake. These lakes form the ultimate headwaters of the Snake River which might be followed to the southwest. But the banding records do not indicate such a course, and so far as they go, seem to show that the birds pass westward to a region of small lakes directly west of the Park. Red Rock Lake from which a single record comes is north of the Continental Divide and in the basin of the Jefferson River, one of the three main sources of the Missouri. One cannot determine whether this bird was on its way around the mountains into the Missouri River valley and had separated from the rest of the flock or whether it marked the way taken by most or all of the migrating birds. In normal flight the pelicans soared far above the summit of the Divide and may easily have crossed it more than once. A line west from Yellowstone Lake to Red Rock Lake would pass over several other lakes and marshy areas in the 70 miles intervening, and would cross the Continental Divide at least twice. The other five places recorded above lie almost in a direct line south of Red Rock Lake down past Great Salt Lake into central Utah. If the birds had followed down the Snake River valley into the Jackson Hole country they would probably have come into Utah too far south to have reached Mud Lake and Red Rock Lake unless those points represent the line of a group seeking the Missouri but by a most circuitous route. Much more natural would be the route to the westward to Red Rock Lake, thence south to Mud Lake, Swan Lake, Garland, Sterling and Aurora, Utah.

It is certain that some of the colony do winter on the Gulf of Mexico, as one band was returned<sup>1</sup> late in the winter from a bird that had been shot some 80 miles

<sup>1</sup> No. 201,843, Otatitlan, Vera Cruz, Mexico, February 26, 1923.

from Vera Cruz, Mexico. It is highly improbable that this bird crossed from the Pacific Coast over the elevated, mountainous, semi-arid Mexican plateau with its evidently scanty food supply and infrequent resting places for such birds. Two other possible routes suggest themselves at once. Some birds may depart from the main route in Utah and move southeast into the Rio Grande Valley, or a part of the group breeding on Yellowstone Lake may follow a route, as yet unmarked, which would bring them into the Missouri Valley and ultimately onto the Gulf Coast. One good observer in the Park told me that some birds approach and leave the Lake from the north along the Yellowstone River. This may mean a migration route via the Missouri.

Both in 1923 and in 1924 the pelicans approached the Lake directly from the south, having been reported at Jackson Lake about May 1. In 1923 the only birds reported stopped a while on Polecat Creek, a good fish stream tributary to the Snake River and about three miles west of the latter in the Park. In 1924 some birds were on the Upper Yellowstone River on May 10, and a group of about 40 was reported from West Yellowstone on May 4. These records conform to the view that the birds approach the lake in the spring by two diverse routes, one up the Snake River and the other from the westward along the route followed in migrating south in the fall. They do not enter the lake until the ice disappears, about June 1, or earlier in some years. Further evidences of the movements of these birds will be awaited with great interest.

I am greatly indebted to Mr. F. C. Lincoln of the United States Biological Survey for important data and valuable criticisms incorporated freely at his suggestion in this paper.

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## VIGOR, DISTRIBUTION, AND PIGMENTATION OF THE EGG

By CHARLES K. AVERILL

IN Chapman's *Handbook of Birds of Eastern North America* it is stated (revised edition, 1912, p. 79) that "fully adult, vigorous birds probably lay larger and more heavily pigmented eggs and more of them than their younger or weaker fellows." Without considering the origin of this belief it seems possible to put it to test as far as pigmentation is concerned by applying it to seasonal migration; for those birds that have acquired breeding ranges well to the north and are forced to make long migrations would be likely to have more vigor than non-migrants or those making short migrations, and would have eggs with more pigment.

A little reflection shows that the distance traveled in their annual journeys is not the only factor to be considered. Not only would the most vigorous push farthest north but they would spread out east and west. We may best express what the statistics will show by saying that pigmentation is related to distribution. It will be seen that in birds of the same family or genus, in a large number of cases the egg with the least pigment belongs to the bird with the restricted range. Since western North American birds have shorter migrations than eastern, and southern birds shorter than northern, it will be seen that the great majority of paler or whiter eggs in the following statistics will be found in the southwestern United States, a region where migration is at a minimum among North American birds.

A number of families of birds have nothing but unpigmented eggs, as swifts, kingfishers, woodpeckers, owls and hummingbirds, and are therefore not available

for our study. Still others of strong flight that wander over wide areas, as swallows, terns, gulls, plovers, sandpipers and a host of sea-fowl, present no cases of very restricted ranges, or if they do are closely related to forms of wide distribution. The majority of examples are from passerine birds.

Of the three decidedly distinct species of North American ptarmigans, one is circumpolar, one breeds in the Arctic regions from Alaska to Ungava, the third is restricted to the mountains of the west. The first two are noted for the most heavily pigmented eggs of all our birds; but the eggs of the White-tailed Ptarmigan, quoting from Coues "is very different, minutely dotted over the whole surface with burnt sienna, few of the markings exceeding a pin's head in size and not thick enough to obscure the ground color." According to Coues the eggs of the Dusky Grouse are "less heavily colored than those of the Spruce Grouse." The second, including its subspecies, extends its range from New Brunswick to Alaska, while the first is a bird of the western mountains.

In the goatsucker family the Nighthawk and all its genus have strongly marked eggs. According to Reed the Western Nighthawk has lighter colored eggs. The Chuck-will's-widow and the Whip-poor-will have well spotted eggs, but those of the Stephens Whip-poor-will of Arizona and New Mexico are nearly immaculate. The Poor-will of the west and all its genus have white or creamy, nearly or quite unmarked, eggs. In the goatsucker family it is seen that the unmarked eggs are of the west and southwest.

Among diurnal birds of prey occur in *Buteo*, *Accipiter*, and some other genera, eggs either unmarked or marked, but the falcons, famed for their dash, speed and spirit have only marked eggs and these are usually dark colored and handsome. Baird, Brewer and Ridgway note that the Cuban Sparrow Hawk's eggs are much lighter in color and less marked than the North American bird's. The Golden Eagle soaring over two continents has marked eggs, but the emblem of our great republic, confined to one continent, therefore with less vigor, has white unmarked eggs.

Among the vireos the only white egg belongs to the Black-capped Vireo of Texas and Mexico.

Coming to the warblers: In the genus *Vermivora*, the most southerly ranging, the Bachman Warbler, lays a pure white egg; the Blue-winged, more northerly, lays an egg sometimes unmarked; the Golden-winged Warbler's is always marked; the Nashville's is well spotted and speckled; the Orange-crowned's egg is speckled chiefly at the larger end; while that of the Tennessee is sometimes speckled all over and has large spots in addition. Here is a somewhat regular increase in pigmentation as the range becomes more northerly. The Virginia's of the southern Rocky Mountains and the Lucy's of the southwest are wreathed with spots at the larger end.

Another white egg is contributed by the Swainson Warbler of the southern states.

The genus *Dendroica* has no white unmarked egg, but those of the Blackpoll, Bay-breasted, Yellow and Blackburn appear to be more heavily marked than the others. According to Chapman the Yellow Warbler's is "thickly marked with cinnamon and olive brown," the Blackpoll's "speckled and generally heavily blotched at the larger end," the Blackburn's "spotted, speckled and blotched with cinnamon-brown and olive," the Bay-breasted's "finely marked chiefly at the larger end;" but Reed notes the Bay-breasted's as heavily blotched, and Coues' Key to North American Birds says they are "profusely spotted." These four birds do not breed south of the Canadian Zone and they reach South America in winter, thus being the long-distance travelers of the genus. Another, the Cerulean Warbler, has eggs decidedly well marked. This bird although southerly in distribution migrates well into the tropics—Panama to Peru in winter—and therefore comes into the same category as the Worm-eating and



Prothonotary warblers which although of southerly breeding range migrate to the tropics and have strongly marked eggs. The second winters from Nicaragua to Colombia, the first winters from Chiapas to Panama.

In the finch family the eggs of the Lapland Longspur are heavily marked. According to Reed those of the Smith Longspur are paler and we may infer from Maynard that the Chestnut-collared's and McCown's are also less marked, as he says "the abundant markings (of Lapland Longspur's) are characteristic." Of the juncos the one unmarked egg is that of the Arizona Junco, whose name indicates its limited distribution. *Spizella* has bluish eggs all marked save that of the Black-chinned Sparrow of Mexico and the southwest border of the United States. *Amphispiza*, a southwestern genus, contributes one bluish-white unmarked egg (Maynard and Davie). The genus *Peucaea* with several species of the south and southwest has nothing but unmarked white eggs. Among the several species of goldfinches, the one white egg is contributed by the Lawrence Goldfinch, breeding in California, the rest of the genus having bluish tinted eggs.

Evidently from the description of towhees' eggs the Arctic Towhee's is the most heavily marked. "Some specimens are so densely marked that the ground color is hardly distinguishable" (Davie). According to Davie both the House Finch of the west and the Guadalupe House Finch of Guadalupe Island frequently have unspotted eggs, the eggs of the Purple, and California and Cassin Purple finches being spotted.

The only northerly birds of this family to lay a white unmarked egg are the Rosy Finches. Here the distribution is limited to the northwest, and the migrations do not extend far south. No doubt the principle that birds breeding in holes and crevices tend to lay unpigmented eggs has an influence here since these birds nest in crevices in rocks.

Among the titmice, the Mountain Chickadee of the western mountains and the Bridled Tit of the southwest furnish the only unspotted eggs.

The bush-tits, a family of the far west and southwest, contribute only white unmarked eggs.

The family Icteridæ, with its numerous orioles, blackbirds and grackles, has but one unmarked egg of a "pale bluish green" (Davie). As usual this is laid by a bird of the southwest, *Callothrux robustus*, the Red-eyed Cowbird.

The numerous thrashers have but one unmarked egg, that of the Crissal Thrasher of the southwest.

We may conclude our statistics with the thrushes. The Hermit, Wilson and Song thrushes have tinted but unspotted eggs. The Olive-backed, Gray-checked and their allied races have well spotted eggs, and their breeding range extends into the Hudsonian Zone.

Since the form of the egg is also an indication of vigor (see Condor, xxv, p. 163) it follows that in most cases the more heavily marked egg is more elongate. Thus the eggs of the Blackpoll, Bay-breasted, Yellow and Blackburn, the most heavily marked in *Dendroica*, are also most elongate. The numerous white eggs laid by the southerly and southwesterly finches are much less elongate than the northerly breeding finches, as figures before me show. The same is true of the egg of the Black-capped Vireo, and again it is seen in the thrushes mentioned above. The egg of the Nighthawk is the most elongate of its family, as it is also the most heavily marked. The data for extending this line of research satisfactorily are lacking, however, as not enough of the eggs under consideration have been measured.

Another correlation is that of length of wing and pigmentation, for since the longer winged make the longer migrations, it follows that the egg with the more pig-

ment is generally laid by the longer winged bird. This can be made out by taking the wing lengths from Ridgway, when it will be found that the more heavily marked eggs alluded to above are laid by the longer winged. But in most cases no measurements are necessary; for the southerly and southwesterly birds we have been dealing with are so much shorter winged that they can be distinguished at a glance. The wing is of the rounded form which indicates a bird of inferior power of flight. The members of the vireo family and of the finch family that are confined to the southwest are of this round winged form. So, too, we can mark the long wing of the falcon and of the nighthawk and be sure these birds have pigmented eggs in a more marked degree than their fellows.

*Bridgeport, Connecticut, February 23, 1924.*

### THE COMMON LOON IN ALBERTA

(WITH TWO PHOTOS)

By A. D. HENDERSON

THE Common Loon (*Gavia immer*) is a rather common summer resident on the numerous small lakes in the vicinity of Belvedere, Alberta. It is a solitary species, one pair of birds only breeding on the small lake chosen for the site of the nest. A pair of Loons will return year after year to the same lake to nest, even though its eggs are repeatedly taken. On other lakes in the vicinity, apparently quite as suitable, they appear during the breeding season only as visitors.

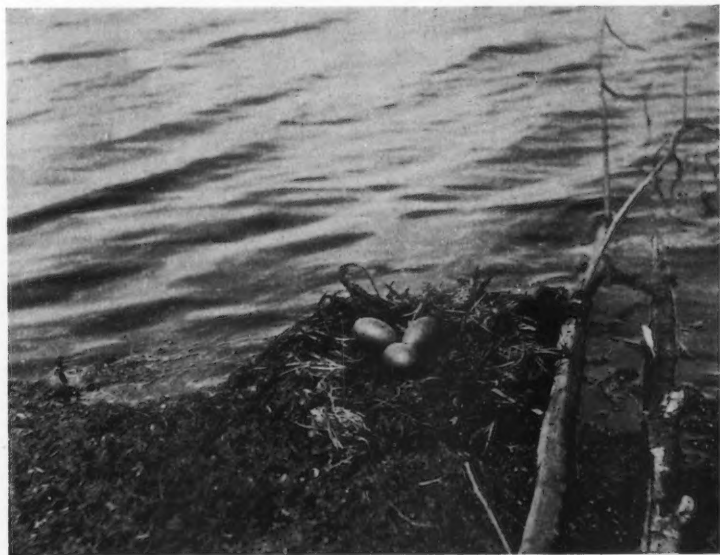


Fig. 43. NEST OF COMMON LOON NEAR BELVEDERE, ALBERTA, MAY 28, 1923.

The number of eggs laid is one, two or three, two being the usual number. Of nineteen nests examined by me in Alberta, only one nest contained one egg, sixteen nests contained two eggs, and two nests contained three eggs. There appears to be a doubt in the minds of some writers as to whether the Loon ever lays three eggs. In Macoun's Catalogue of Canadian Birds he states that "All members of the Geological Survey who have found Loons' nests agree with Macfarlane that they lay two eggs and no nest is built." Audubon, on the contrary, stated that three eggs was the usual number laid by this bird.

The first nest of the Loon containing three eggs, observed by me, was on June 8, 1920. It was on a small lake near Belvedere where a pair of loons breed regularly every year. The nest was situated in coarse marsh grass, in water about six inches deep. It was a large, well-built structure, of dry and green coarse grasses, rushes, goose grass, a small fine water weed, and three pieces of waterlogged wood.



Fig. 44. IMMATURE COMMON LOON ON THE ICE;  
PEACE RIVER DISTRICT, ALBERTA, NOVEMBER, 1915.

Another nest of three eggs, which is the one illustrated herewith, was found on May 28, 1923, by Mr. R. C. Harlow and myself. This nest also was on a small lake near Belvedere. A Loon's nest is usually very easily found, as it is quite conspicuous. It is also often located by a tell-tale ripple as the bird leaves the nest in a long dive, coming to the surface some distance out in the lake. On this occasion, however, Mr. Harlow and I both passed the nest twice, although we were looking specially for it.



I happened to discover it in a backward glance, situated at the edge of a stretch of mud between the grass-grown shore and the water, a most unusual situation, as the nests are usually well within the growth of coarse grass, reeds or rushes along the shore. The lake was at a very low level this season, which probably accounted for the unusual position of this nest.

The Loon shows preference for a nesting site on some point or small island consisting of a few clumps of grass tussocks; but it also breeds at other places along the shore.

All the nests I have seen were in the water or beside it, so that the bird could dive off the nest into the water. In North American Diving Birds, Mr. Bent states, "I believe they prefer to occupy the same nest every year and they probably add to it a little every year." I have never found this to be the case. Even when a second set is laid the same year, a new nest is built, only one exception to this rule being observed. On May 29, 1923, Mr. R. C. Harlow and myself took a set of two Loon's eggs from a nest on another small lake, and on July 2 a second set of two was found in the same nest.

All nests of the Loon which I have seen in Alberta were large, well made structures; but some were bulkier and of more elaborate build than others. Four out of the nineteen were on old muskrat houses. When built on a muskrat house it is either a partly demolished one almost level with the water or on the submerged side of one still standing.

In early November, 1915, I found a young Loon on the ice at Island Lake in the Peace River country. It was unable to fly and was bravely walking south. On my approach it advanced gallantly to the attack, pecking at my legs. It had not a chance in the world for its life, as it would soon have starved or been picked up by a hungry coyote. I admired its bravery and would like to have saved it, but thought it best to put it out of misery.

The Loon has several calls, but they are difficult to express on paper. One, uttered on the water, is a long mournful wail, *wah-lay-oo*; another, heard when a bird is flying overhead, is *wah-wullah-wullah-wuh*; another, uttered on the water, is *ah-week-weeul*, with variations. On April 29, 1923, I observed a pair of Loons on Lac La Nonne giving this call with both wings extended; then after swimming around each other and taking very short dives, each took a long dive out in the lake. This apparently was part of their courtship.

The following are a few dates for the arrival of the Loon at Belvedere: April 28, 1899; April 28, 1901; April 21, 1902; May 6, 1920; April 26, 1921; May 2, 1922; and April 28, 1923. Last seen in 1923 on October 28.

My earliest nesting date is May 24, and fresh eggs can be found through the first week in June. In two instances the time between the taking of the first set and the building of a new nest and laying of the second set was fourteen and fifteen days, respectively. It may have been a shorter period, as the nesting places were not examined between dates.

*Belvedere, Alberta, February 21, 1924.*

## WEIGHTS OF ABOUT THREE THOUSAND EGGS

By WILSON C. HANNA

DURING a number of years I have been determining the weights of eggs with a view of obtaining additional data and possibly opening a new line of research.

This work has given me considerable pleasure, and some ornithologists and oologists have asked for a report of my methods and of the results of my tests.

As incubation advances eggs become lighter in weight, and an egg at the point of hatching may be as much as 11 percent lighter than the fresh egg. With age, eggs also lose weight. It is thus evident that, for reliable data, weights must be determined on eggs in the early stages of incubation, and this must be done either in the field or, if the eggs are collected, within a few days at most. I have followed the practice suggested.

I have used the metric system, reporting all weights to the nearest 1/100 of a gram. The balance used, in most cases, has been sensitive to 1/10,000 of a gram. A single egg has been weighed at a time, and I have not found it necessary to collect all eggs in order to obtain the weights.

The weight of the smallest Costa Hummingbird egg is 0.37 grams, while the weight of the largest Golden Eagle egg is 411 times as much or 152.15 grams. Ornithologists who are recording the weights of the birds may find some interesting results if they will compare their notes with mine.

In presenting the summary of my results I must give considerable credit and thanks to the following gentlemen, who have helped me in locating nests, and in climbing trees and cliffs: Fred Frazer, M. French Gilman, W. D. LaNiece, R. B. Herron, Ralph Jones, Albert Jones, N. K. Carpenter, Lewis Swinney, and Donald Still.

This table covers the weights of about three thousand eggs, of one hundred and twenty-four species and subspecies, all from points within a few hundred miles of Colton, California.

Under the heading "number of eggs" is given the number of eggs of the species that have been weighed, while in the next column "average weight" is the average weight of the eggs of each species. Where the weights of a large number of eggs of a single species have been determined, this average must represent the true weight, while where only a few eggs have been weighed there is a chance that the average will be changed when more data are obtained. The reader can judge the value of the average by the number of eggs weighed.

My friends have always asked for the maximum and minimum weights, and for a comparison with the other eggs of sets containing the extremes. These features are indicated under the last heading: "Sets showing maximum, minimum and normal." Usually I have deemed it best to list two or three complete sets so that the reader can see how sets with large, small, or normal eggs vary in size. The weights of eggs of one set are recorded in a horizontal row, and where there are more than four in the set the balance are grouped close to the others. In order to help in making comparisons I have listed the largest eggs of a set first (towards the left), and the smallest eggs in the set last (towards the right). The maximum and the minimum weights for each species are in italics. Take, for example, the Long-eared Owl (*Asio wilsonianus*). Forty-two eggs were weighed, and the average weight was 22.36 grams; the first set of five contained the maximum egg, weighing 26.68 grams; the second set of four contained the minimum egg, weighing 16.22 grams; the third set of four is given as a normal set.

These results are given for what they are worth, and with the idea of getting others started at the work in other districts. With data at hand from other places this table may prove to be of much greater interest.

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
16	Ptychoramphus aleuticus .....	1	27.20	27.20			
25	Brachyramphus hypoleucus .....	5	35.22	36.91 36.43	35.62 32.61		
49	Larus occidentalis .....	72	89.14	102.30 76.80 92.00	101.85 73.75 89.89	94.55 71.65 84.08	
74	Sterna antillarum .....	17	7.95	9.13 7.25 8.12	8.48 7.21 7.80	6.79	
120c	Phalacrocorax a. albociliatus.....	13	45.12	51.18 43.37	46.29 41.40	45.99 40.08	45.68 39.63 38.62
127	Pelecanus californicus .....	21	110.28	124.67 104.99 112.60	122.37 103.10 112.10	118.87 97.10 108.10	
201c	Butorides v. anthonyi .....	8	16.87	19.19 15.87	18.83 15.87	17.73 15.66	16.65 15.11
210.1	Rallus levipes.....	7	21.03	21.85	21.12 20.91	21.09 20.80	20.99 20.51
278	Aegialitis nivosa .....	12	7.98	8.71 7.81 8.09	8.65 7.61 8.00	8.16 7.59 7.92	
292a	Oreortyx p. plumifera .....	25	10.41	11.35 11.06 10.69 10.84 10.81 10.77	11.32 10.90 10.68 10.69 10.58 10.36	10.62 10.56 10.48 10.35 10.22 10.03	10.48 10.26 9.51 9.86 9.63 9.60 8.71
294a	Lophortyx c. vallicola .....	28	8.93	9.64 9.43 9.16 8.91	9.47 9.36 8.86 8.85	8.82 8.76 8.72 8.70	8.61 8.48 7.92 7.74
295	Lophortyx gambeli .....	17	9.19	10.89 10.59 10.34 9.66	9.50 9.26 9.27 9.09	8.76 8.61 8.84 8.73	8.69 8.64 8.47 8.43 8.40
316a	Zenaidura m. marginella.....	14	6.27	7.15 6.06 6.35	6.78 5.14 6.04		
319	Melopelia a. trudeaui .....	18	6.82	8.93 5.76 6.84	7.91 4.82 6.69		
320a	Chaemepelia p. pallescens .....	2	3.07	3.13	3.01		
325	Cathartes a. septentrionalis ....	10	78.57	92.78 69.22 78.30	91.89 68.49 72.71		
333	Accipiter cooperi .....	26	33.93	38.80 30.96 34.42	37.60 30.40 34.37	29.93 33.71	28.72 33.54

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
337b	Buteo b. calurus .....	26	65.33	81.06	78.69	77.16	
				55.81	55.23	52.71	
				68.10	67.20	63.60	
339b	Buteo l. elegans .....	28	51.74	55.25	54.49	54.24	52.88
				48.36	46.53		
				52.17	51.48	51.27	
349	Aquila chrysaetos .....	17	134.48	152.15			
				113.87			
				134.00	132.50		
360a	Falco s. phalaena .....	36	13.75	15.90	15.35	15.35	15.29
							14.83
				10.81	10.53	10.51	9.94
				13.43	13.03	12.72	12.64
							12.47
365	Tyto a. pratincola .....	34	23.41	26.43	25.19	24.50	19.47
				25.53	24.86		
				24.49	23.50	22.67	22.64
				24.09	23.14	22.66	21.88
366	Asio wilsonianus .....	42	22.36	26.68	24.93	24.33	24.33
							24.21
				19.84	19.48	19.14	16.22
				22.92	22.83	22.71	22.05
373c	Otus a. bendirei .....	20	17.14	19.48	18.88	17.85	17.79
				17.09	16.86	16.70	14.95
				17.21	17.01	16.52	
373f (part)	Otus a. gilmani .....	3	15.51	16.14	15.43	14.96	
375d	Bubo v. pacificus .....	6	54.48	55.13	54.37	54.07	52.34
				56.00	55.00		
378	Speotyto c. hypogaea .....	14	10.84	11.80	11.50	10.80	10.70
					11.40	11.30	11.10
				11.51	11.06	10.34	10.09
					10.47	10.17	9.49
385	Geococcyx californianus .....	39	18.90	21.54	15.44		
				19.92	19.79	19.53	19.20
							17.82
387a	Coccyzus a. occidentalis .....	44	9.87	11.20	10.86	10.49	
				10.59	9.74	7.69	
				9.97	9.81	9.77	9.69
394e	Dryobates p. turati .....	7	2.10	2.33	2.33	2.24	2.23
				1.99	1.85	1.74	
396	Dryobates s. cactophilus .....	4	2.90	3.13	2.97	2.82	2.66
397	Dryobates nuttalli .....	19	2.94	3.18	2.97	2.74	2.71
				3.05	2.84	2.82	2.61
413	Colaptes c. collaris .....	45	7.21	8.62	8.36	8.36	7.93
						8.56	7.77
				6.64	6.45	6.32	6.03
							5.44
				7.32	7.05	6.94	6.77
						6.92	6.64
414	Colaptes chrysoides .....	3	7.06	7.11	7.09	6.98	
418b	Phalaenoptilus n. californicus..	2	4.41	4.70	4.12		
421	Chordeiles a. texensis .....	6	5.67	6.62	6.46		
				5.34	4.68		
				5.62	5.28		
425	Aeronautes melanoleucus .....	38	2.02	2.45	2.45	2.36	
						1.27	
				2.16	2.00	1.99	1.93

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
429	Archilochus alexandri .....	18	0.44	0.51 0.39 0.46	0.47 0.37 0.43		
430	Calypte costae .....	28	0.42	0.45 0.39 0.43	0.44 0.37 0.40		
431	Calypte anna .....	6	0.51	0.57 0.48 0.52	0.54 0.47 0.48		
447	Tyrannus verticalis .....	18	3.39	4.23 2.18	4.05 2.15	3.99 2.10	3.96 2.09 2.06
				3.90	3.82	3.78	3.73
454	Myiarchus c. cinerascens .....	47	3.29	3.96 3.06 3.44	3.95 3.05 3.39	3.85 2.89 3.34	3.76 3.62 2.78 3.28 3.21
457	Sayornis sayus .....	7	2.29	2.57 2.54	2.01 2.34		2.29 2.01
458	Sayornis nigricans .....	27	2.08	2.40 2.01 2.09	2.30 1.97 2.07	2.30 1.84 2.04	2.30 1.80 1.96
462	Myiochanes r. richardsoni .....	12	1.77	2.03 1.77 1.78	1.77 1.69 1.77	1.76 1.64 1.74	
464	Empidonax d. difficilis .....	17	1.59	1.79 1.59 1.62	1.62 1.57 1.60	1.61 1.57 1.52	1.49 1.40
466	Empidonax t. trailli .....	35	1.68	1.96 1.49 1.77	1.93 1.43 1.73	1.86 1.43 1.66	1.56
469	Empidonax wrighti .....	3	1.65	1.66	1.66	1.64	
471	Pyrocephalus r. mexicanus .....	1	1.43				
474e	Otocoris a. actia .....	19	2.42	2.85 2.49 2.40	2.77 2.29 2.37	2.73 2.17	
481	Aphelocoma c. californica .....	24	6.05	6.85	6.79	6.59	6.48 6.17 5.10
486	Corvus c. sinuatus .....	10	21.22	22.86	22.74	22.42	21.20 19.35
488b	Corvus b. hesperis .....	9	14.93	15.94 15.47	15.03 15.18	14.38 15.06	13.49 14.91 14.89
495a	Molothrus a. obscurus .....	39	2.26	2.75 1.62 2.24	1.53		
496a	Tangavius a. aeneus .....	1	4.06				
498e	Agelaius p. neutralis .....	30	3.77	4.65 3.62 3.95	4.55 3.27 3.92	4.35 3.72 3.83	2.92
501.1	Sturnella neglecta .....	9	6.00	6.52 6.10	6.33 5.85	6.31 5.62	6.16 6.04 5.06

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
504	Icterus parisorum .....	21	3.64	4.13 3.21 3.65	4.00 3.14 3.62	3.81 2.93	3.56
505a	Icterus c. nelsoni .....	11	2.32	2.73 1.98 2.64	2.61 1.96 2.63	2.56 1.93 2.51	1.71 2.30
508	Icterus bullocki .....	84	3.02	3.53 2.80 3.12	3.56 2.78 3.12	3.24 2.74 2.76 2.99	3.04 2.70 2.60 2.98 2.93
510	Euphagus cyanocephalus .....	33	4.68	5.32 4.33 4.81	5.27 3.83 4.79	5.23 3.82 4.70	5.17 5.11 4.65 4.60
519	Carpodacus m. frontalis .....	66	1.83	2.45 1.91 1.93	2.40 1.88 1.85	2.29 0.99 1.82	2.16 1.72
529b	Astragalinus t. salicamans .....	7	1.33	1.45 1.33	1.44 1.26	1.36 1.15	1.30
530a	Astragalinus p. hesperophilus....	27	1.05	1.24 0.97 1.15	1.16 0.93 1.13	1.15 0.89 1.09	1.14 0.87 1.07
531	Astragalinus lawrencei .....	9	1.04	1.18 0.88	1.15 0.84	1.13 0.82	1.11
543	Passerculus beldingi .....	3	2.25	2.27	2.24	2.23	
552a	Chondestes g. strigatus .....	40	2.81	3.55 2.38 2.90	3.41 2.31 2.88	3.13 2.26 2.78	2.09 2.74 2.61
560a	Spizella p. arizonae .....	15	1.47	1.75 1.43 1.48	1.66 1.34 1.46	1.61 1.26 1.43	1.61 1.34
562	Spizella breweri .....	18	1.42	1.63 1.33 1.47	1.62 1.24 1.45	1.61 1.21 1.32	1.59 1.14
565	Spizella atrogularis .....	60	1.56	1.87 1.26 1.62	1.81 1.21 1.56	1.71 1.12 1.46	1.12
.....	Passer domesticus .....	5	2.52	2.64	2.57	2.49	2.46 2.43
567c	Junco o. thurberi .....	4	2.08	2.15	2.11	2.08	2.00
574	Amphispiza belli .....	23	2.01	2.42 2.02 2.05	2.33 1.96 2.01	2.31 1.91 2.00	2.19 1.69 1.96
574.1b	Amphispiza n. canescens.....	3	2.03	2.11	2.04	1.94	
580	Aimophila r. ruficeps .....	22	2.14	2.48 2.19 2.19	2.20 2.16 2.07	2.23 2.12 2.05	2.14 1.91
581m	Melospiza m. cooperi .....	48	2.41	2.87 2.52 2.49	2.76 2.36 2.41	2.69 2.07 2.41	2.86 2.05 2.40
585d	Passerella i. stephensi .....	5	3.43	3.66 3.51	3.37 3.48	3.14	

A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
588d	Pipilo m. megalonyx	27	4.13	4.59 3.79 4.31	4.41 3.73 4.24	4.38 3.37 4.07	4.33 3.74
591.1a	Pipilo c. senicula	73	4.29	5.30 4.03 4.39	5.19 3.60 4.29	4.94 3.54 4.23	4.93 3.22
592	Pipilo aberti	17	4.04	5.59 3.46 4.20	3.96 3.03 4.08	3.82	
592.1	Oreospiza chlorura	55	2.91	4.02 2.69	3.92 2.66	3.73 2.50	3.47 2.43 2.16
594	Pyrrhuloxia s. sinuata	14	3.54	3.04 4.21 3.31	2.97 3.96 3.19	2.93 3.74 3.06	
596	Zamelodia melanocephala	23	3.83	4.37 3.52	4.05 3.47	4.02 3.27	4.01
597a	Guiraca c. lazula	7	2.97	3.19 2.92	2.86 2.83		
599	Passerina amoena	36	1.94	2.23 1.64	2.15 1.54	2.13 1.41	2.02
607	Piranga ludoviciana	13	3.30	3.33 3.44	3.60 3.22	3.49 3.16	3.35 3.02 2.81
612	Petrochelidon l. lunifrons	33	2.04	2.66 1.81 2.16	2.56 1.79 2.13	2.44 1.72 2.11	1.87
616	Riparia riparia	1	1.38				
617	Stelgidopteryx serripennis	14	1.77	2.00 1.71 1.81	1.98 1.70 1.80	1.80 1.66 1.78 1.69	1.74 1.68 1.76 1.68
620	Phainopepla nitens	17	2.78	3.19 2.53 2.94	2.91 2.14 2.74		
622b	Lanius l. gambeli	77	4.67	5.72 3.96	5.57 4.12	5.56 4.12 3.91 4.90	5.19 4.07 3.82 4.50
627a	Vireosylva g. swainsoni	8	1.84	4.70 2.21 1.71	4.90 2.06 1.67	4.90 2.04 1.62	1.91 1.50
629a	Lanivireo s. cassini	15	1.88	2.24 1.63 2.04	2.16 1.63 1.89	2.12 1.59 1.87	2.12 1.57
632	Vireo h. huttoni	4	1.56	1.63	1.59	1.51	1.51
633a (part)	Vireo b. pusillus	9	1.33	1.44 1.25	1.41 1.23	1.41 1.21	
633a (part)	Vireo b. arizonae	34	1.41	1.58 1.11	1.54 1.54	1.54	1.51
643	Vermivora luciae	15	1.03	1.21 0.94 1.05	1.18 0.89 1.03	1.15 0.80 0.99	
652c	Dendroica a. brewsteri	12	1.43	1.63 1.27	1.60 1.26	1.59 1.20	1.54 1.13
665	Dendroica nigrescens	6	1.36	1.53 1.26	1.46 1.26	1.43 1.24	



A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
681c	<i>Geothlypis t. scirpicola</i> .....	8	1.64	1.75 1.66	1.68 1.64	1.65 1.62	1.53 1.61
683a	<i>Icteria v. longicauda</i> .....	36	3.73	4.48 3.46 3.87	4.43 3.34 3.76	4.27 2.91 3.54	
685b	<i>Wilsonia p. chryseola</i> .....	2	1.175	1.18	1.17		
703a	<i>Mimus p. leucopterus</i> .....	20	3.97	4.93 4.09 4.17	4.16 3.42 4.12	3.78 3.40 3.85	3.41 3.30 3.76
707a	<i>Toxostoma c. palmeri</i> .....	61	5.86	7.07 5.35 6.01	6.81 5.21 5.78	5.05 5.74	
708	<i>Toxostoma bendirei</i> .....	56	4.59	5.63 4.11 4.65	3.99 4.62	3.84 4.54	4.27
710	<i>Toxostoma redivivum</i> .....	51	6.58	8.06 5.20 6.73	7.60 5.10 6.56	7.54 4.90 6.31	7.36
711	<i>Toxostoma l. lecontei</i> .....	21	4.86	5.39 4.58 4.96	5.33 4.42 4.91	5.10 3.99 4.69	
712	<i>Toxostoma crissale</i> .....	16	5.26	5.63 4.69 5.39	5.60 4.58 5.37	5.38 5.00	
713	<i>Heleodytes b. couesi</i> .....	71	3.57	4.19 3.25	3.88 3.21	3.79 3.17	3.45 3.04 2.91 3.51
715	<i>Salpinctes o. obsoletus</i> .....	42	2.27	3.67 2.73 2.47	3.62 2.71 1.95	3.59 2.67 1.94	2.56 2.48 1.90 1.84
717b	<i>Catherpes m. punctulatus</i> .....	65	1.73	1.99 1.64	1.92 1.62	1.80 1.78 1.62	1.78 1.68 1.51 1.46 1.71
719d	<i>Thryomanes b. charienturus</i> .....	22	1.46	1.79 1.67 1.47	1.74 1.61 1.45	1.73 1.61 1.37 1.26	1.57 1.52 1.34 1.11
721a	<i>Troglodytes a. parkmani</i> .....	29	1.31	1.62 1.58 1.17 1.28 1.40	1.50 1.56 1.20 1.17 1.36	1.49 1.56 1.08 1.12 1.32	1.55 1.40 0.96 1.29 1.26
730	<i>Sitta p. pygmaea</i> .....	6	1.27	1.35	1.32	1.31 1.27	1.26 1.14
733	<i>Baeolophus i. inornatus</i> .....	6	1.73	1.79	1.75	1.74 1.70	1.73 1.66
738a	<i>Penthestes g. baileyae</i> .....	13	1.23	1.39 1.35 1.14	1.37 1.34 1.13 1.12	1.32 1.31 1.12 1.09	1.29 1.06
742a	<i>Chamaea f. henshawi</i> .....	16	1.80	2.06 1.87	2.02 1.87	2.00 1.61	1.95 1.86 1.53



A.O.U. No.	Species	Number of eggs	Average weight	Sets showing maximum, minimum and normal			
743	<i>Psaltiriparus m. minimus</i> .....	97	0.76	0.94	0.90	0.86	0.81
					0.88	0.83	
				0.85	0.70	0.65	0.50
						0.60	
				0.78	0.78	0.76	0.73
					0.77	0.76	
746	<i>Auriparus f. flaviceps</i> .....	73	0.96	1.12	1.09	1.08	1.07
				0.92	0.88	0.85	0.85
751a	<i>Polioptila c. obscura</i> .....	70	0.94	1.11	1.07	1.05	1.05
				0.80	0.80	0.80	0.70
						0.80	
				0.91	0.99	0.98	0.95
752	<i>Polioptila plumbea</i> .....	13	0.92	1.01	0.95	0.94	0.93
				0.98	0.96	0.94	0.84
						0.89	
753	<i>Polioptila californica</i> .....	7	1.03	1.10	1.06	1.03	1.01
					1.05	0.99	0.96
758	<i>Hylocichla u. ustulata</i> .....	18	3.46	3.82	3.82	3.77	
				3.53	3.42	3.11	
759e	<i>Hylocichla g. sequoiensis</i> .....	3	2.95	3.02	2.92	2.91	
761a	<i>Planesticus m. propinquus</i> .....	8	6.30	7.16	7.07	7.03	6.78
				5.72	5.63	5.65	5.34

Colton, California, February 21, 1924.

## FROM FIELD AND STUDY

**California Pelican: An Addition to the Arizona List.**—In the autumn of 1914 or 1915, an adult California Pelican (*Pelecanus occidentalis californicus*), which had alighted on a reservoir at the edge of the village, was shot by Mrs. J. L. Moore, at Dos Cabezos, Cochise County, Arizona. It came into the possession of Mr. E. O. Kelley, who had it mounted in a soaring attitude.

In the summer of 1919 this bird was suspended from the ceiling of the dining-room in the Montgomery Hotel, in Dos Cabezos, where I measured it. Its dimensions were: Right wing, 550 mm.; left wing, 532; tail, 160; tarsus, 84; exposed culmen, 323; middle toe with claw, 112. The proprietress of the hotel gave me history of the bird, which was later confirmed by the local storekeeper. Both had known of its capture at the time it was shot.—J. EUGENE LAW, *Altadena, California, March 20, 1924.*

**A California Condor in Captivity.**—On October 23, 1923, representatives of this Museum surprised and captured uninjured a young Condor (*Gymnogyps californianus*) in the mountains of Ventura County, near Fillmore, California. It was about three-quarters grown, evidently a bird of the previous spring, and was found in a nesting cave where probably it had been hatched, and from which it could not escape when the entrance was blocked.

The bird is now on exhibition at the Selig Zoo, Los Angeles, where it will be kept indefinitely. It is believed to be the only one of its species now in captivity.—L. E. WYMAN, *Los Angeles Museum, April 4, 1924.*

**An Unique Swallow's Nest.**—During the summer of 1922 a colony of Cliff Swallows (*Petrochelidon lunifrons*) occupied the frieze of a barn on the farm of Mr. A. F. Mossholder in the Tiajuana Valley, San Diego County, California. One day a nest containing three young birds about a week old fell to the ground. Mrs. Mossholder saw the catastrophe and endeavored to save the birds.

As the nest was badly broken in the fall, it was obvious she could not return the youngsters to their original home. Selecting an old tomato can with the top half open, she nailed it to the side of the barn as near the old nest as possible. With parts of the broken nest she made a bed for the young birds and placed them in it. In a couple of hours the parent birds appeared and began to build a "neck" of a nest over the opening in the can.



Fig. 45. EMERGENCY NEST OF CLIFF SWALLOW

The young birds were quite content in their new home and the parent birds continued their ministrations until the fledglings took wing and were able to forage for themselves. When the Mossholders moved to a new home some miles distant they remembered the unique nest and took it with them, to be turned over later to the Natural History Museum, Balboa Park, San Diego, where it now occupies a post of honor among the interesting things that make up the Museum's School Educational Exhibit.—W. S. WRIGHT, *Supervisor of Nature Study, Natural History Museum, Balboa Park, San Diego, California, January 5, 1924.*

**Escaped Foreign Cage Bird Survives Winter.**—The future of our fauna is endangered by every introduction of an exotic species, whether purposeful or accidental. Prevention of intentional introductions is difficult enough, but still more difficult is any control over the chance escape of cage birds.

On November 25, 1923, Miss Julia Harbison wrote me regarding a strange bird that had for several days been feeding on toyon berries in her yard near Vacaville, California. Her description left no doubt that the bird concerned was the commonly imported cage bird known as the Canton Grosbeak (*Eophona melanura*).

On January 31, 1924, Miss Harbison again wrote that the bird was still to be seen in the same general locality. The fact that the bird was extremely tame and would drink from a dish of water placed for it seemed to indicate that it had been a cage bird. I suggested that observations on the bird might be worth recording and that a check as to its identity, by the writing of another careful description, would be worth while. On February 13, 1924, Miss Harbison furnished the following description and habit notes:

"The black of the head covers the forehead, crown, lores, chin, part of the throat, and all, or nearly all, of the malar region, ear coverts and occiput. It hardly seems to me to quite cover these last regions, but the black extends well back of and below the eye. The eye is black without a trace of eye-ring or stripe.

"The under parts are light gray, becoming lighter until white on the lower tail coverts. The sides and flanks are lightly washed with pale orange, this color seeming to reach up under the wing.

"The back is darker gray than the under parts, in some lights showing a brownish cast, becoming gradually a lighter gray on the rump to very light on the upper tail coverts. The tail is black and double rounded.

"I may go a little wrong on the wing, but the black seems to be restricted to the primaries, the ends of the primary feathers being white with other white places showing near the end. The rest of the wing is dark gray or brownish gray like the back. (This gray is dark only by comparison with the under parts.) When the bird flies the white of the wings is very conspicuous in patches. At rest, the black hood and the large bill are its most striking features.

"As to the bird's general habits, I can supply only a few meager details, as I have very little leisure to follow it about. Its environment here is an orchard, one and one-half miles from Vacaville. Besides a row of shrubs bearing red berries beside the dwelling, there are, near by, orange trees rather densely foliated, pepper trees, fig trees, and a walnut tree bare of leaves this time of year. All about are smaller deciduous trees.

"When I see the bird it is most often eating the berries of toyon and of pyracantha, which it seems to like equally well. It eats these literally by the hour, audibly crushing the seeds with its massive bill; I wonder how it gets enough to eat on the days it forsakes our bushes. I have never seen it eat anything else. I have seen it drink twice. Once when I saw it hopping along on the ground in an open space as if looking for something, I thought perhaps water, I placed a saucer of water on the ground; it flew to a near-by clothes-line until I retreated and then hopped down and drank. Another time it flew down from a toyon shrub to a puddle close by and drank.

"Only once have I seen it fly into an orange tree, and perhaps two or three times into the pepper trees. It appears to choose the leafless walnut and fig trees, where it perches either on a low branch or on the very top. I have seen it fly from one tree top to another a hundred yards away. Never have I seen it on the ground except when it was after a drink.

"It does not call very much, which probably accounts for my failure to locate it some days. At first, I used to hear it only early in the morning; but I have since heard it call throughout much of the day. It is always perching in the open trees at such times. When too close approach frightens it, it gives two or three notes and flies away."—HAROLD C. BRYANT, *Museum of Vertebrate Zoology, Berkeley, California, April 10, 1924.*

## WITH THE BIRD BANDERS

Under the Direction of J. Eugene Law, Altadena, California

**Annual Census.**—In order to provide a measure of growth of banding activities in the west, a list of all birds banded in the "Western Province" is presented on the inside of the back cover of this issue. Approximately one year has elapsed since effort began to be especially directed to the development of this movement in this region. Prior to this period a half-dozen or less of banders had spontaneously developed and had banded only a modicum of birds.

"Western Province" is here used to designate the Pacific and plateau regions of North America which are naturally delimited by the eastern base of the Rocky Mountains, and it is this region, roughly tied in by state lines, which has been assigned by the Biological Survey to the Cooper Ornithological Club for purposes of promoting banding. Since many of the birds that breed in the north of this province winter in the south of it, it is fitting that the entire region be thus coordinated.

The Cooper Club claims only a portion of the credit for such development as this census shows. Some of our most active banders in the west were 'discovered' by the New England or other outside organizations. Other banders have developed independently. I am satisfied, too, that there are some who have done banding work in the west, either as visitors or as residents, whose names have not yet come to me, and whose work is therefore not included in this report. Will any such please file their names with me at once?

My list of permittees in the Western Province totaled 86 on March 1, 1924. Of these, 28 responded to the call for totals and 10 others reported failure to band birds during the preceding year. The 29 active banders, then, whose totals of birds banded are summarized on the inside back cover, are:

## ALBERTA

Patton, Dan

## BRITISH COLUMBIA

Gillingham, Donald W.

Mayers, F. J.

Munro, J. A.

Pearce, Theed

## COLORADO

Bergtold, Dr. W. H.

Copeland, Miss Ada B.

## MONTANA

Evans, W. V.

## NEW MEXICO

Jensen, J. K.

## UTAH

Anderson, Harrison

## CALIFORNIA (northern)

Allen, Mrs. Amelia S.

Baxter, Philip N.

Bryant, H. C.

Clabaugh, Ernest D.

Duncan, Carl D.

Kibbe, A. S.

LaJeunesse, H. V.

Quayle, Ernest H.

Strong, W. A.

## CALIFORNIA (southern)

Barnes, C. A.

Ellis, Mrs. Ella H.

Johnson, Dr. H. W.

Law, J. Eugene

Pierce, Wright M.

Potter, Miss Jessica A.

Pratt, Miss Helen S.

Robertson, John McB.

Ross, Roland C.

Wood, Dr. C. H.

Subspecific differentiations are purposely omitted in the list of birds banded. In every case the name used is intended to embrace the whole species, and thus to include all of its subspecies which have been included in the reports received.

**Warning.**—(Particularly directed to ornithologists of the older school). Many of you have already received from me a letter in which I endeavor to persuade you to equip yourself as a bander and learn the simple technique of trapping and banding the birds. I have emphasized the necessity that this work be started in each community by a well-informed bird student, who shall act as a nucleus and about whom activities in bird banding may develop in a thoroughly comprehensive manner.

Excepting for a rare enthusiast the response to my letters has been negative. Not one of you but believes that this line of effort is a good one (for the other fellow), all agree that it has great possibilities for the advancement of ornithological knowledge and most of you would like to engage in the work if you had the time.

Some day you are going to ask yourself why you procrastinated in joining this splendid work. When you do become an enthusiast, as you are sure to do, once you begin the work, you are going to look with regret at these passing months in which you might have banded wanderers whose return to your station would mark a big event in bird travel.

No ornithologist need look upon this work as a waste of his time. He will be amply repaid for every moment he devotes to it. The intimate contact with the live uninjured birds will make for better field observations and for better closet natural history.

It seems to me that the advanced bird students have a certain responsibility in the development of this method of bird study, a sponsorship which has thrust itself upon them, for how else can the value of bird banding be insured to ornithology.

**Subspecific Names.**—Many banders are devoting time and energy to subspecific identifications of the birds they are banding. For purposes of mental calisthenics, such efforts are entirely harmless. But sight identifications of subspecies, even at arm's length, are treacherous at best, and only encumber the records with data which is incapable of confirmation.

It is, therefore, recommended that, for purposes of communication between banders and about banding, forms like "*Melospiza melodia*, subsp.," "*Passerella iliaca*, subsp.," etc., be used. By this method banders will avoid responsibility for an added burden to the growing confusion of authenticated and unauthenticatable records which comprise our ornithological literature. Banding, for the present, at least, is occupied with what the individual bird does, rather than with its family tree. A simple nomenclature suffices.

**Banding Nestlings.**—Nestlings nearly fledged had best be left undisturbed, for they can rarely be persuaded to stay in the nest after being removed for banding, and when out their chance of survival is materially reduced. They can be banded without danger of stampede at any younger stage, after the 'tarsus' is long enough to receive the band. Remove all in the nest to a box, best soft lined, and return them to the nest, one by one, as banded. Deliberate motions on the part of the bander frighten the nestlings least. Use the size of band which an adult of the species requires.

If trapper's lore is correct, approach to the nest should be made before mid-afternoon, in order that night prowling predators will not have the fresh scent of the bander to guide them to the nest. One needs, also, to be alert for spying shrikes, jays, and crows, which are always on the lookout for nestlings. If such are about, drive them from the neighborhood until the parents of the nestlings are again in charge.

Unfeathered nestlings must not be exposed to the direct rays of a hot sun nor to chilling winds. They succumb quickly to either, and especially quickly to the former.

If one observes these simple cautions, nestlings suffer no inconvenience from being banded. By all means, lose no opportunity to band them.

**Los Angeles Chapter.**—On February 10, 1924, the Los Angeles Bird Banding Chapter of the Cooper Ornithological Club reorganized with 16 members present. A similar meeting, a year ago, had proved premature. Under appointment by the Southern Division of the Club, J. Eugene Law acted as chairman, and Mrs. Ella H. Ellis was named as secretary. The roll of charter members, which includes the other banders who have signified a desire to be included but were unable to be present at the meeting, is as follows:

C. A. Barnes  
Frances V. Barnes  
Elbert Benjamine  
Mrs. F. T. Bicknell  
Elizabeth F. Burnell  
Carl Chambers  
W. Lee Chambers  
M. W. de Laubenfels  
Ella H. Ellis

Mrs. C. H. Hall  
A. B. Howell  
H. W. Johnson  
George L. Kaeding  
Margaret Kaeding  
J. Eugene Law  
Laura B. Law  
Luther Little  
R. J. Middleton

Loye Holmes Miller  
Helen S. Pratt  
Ethel Randall  
J. McB. Robertson  
Roland C. Ross  
Jesse H. Taylor  
L. E. Wyman

Meetings are to be held on the second Sunday of each month.

J. EUGENE LAW, *Altadena, California, April 5, 1924.*

## PUBLICATIONS REVIEWED

FORBES AND GROSS: "On the numbers and local distribution of Illinois land birds of the open country in winter, spring, and fall."\*—In view of the Government's interest in bird censuses and the growing popularity of such censuses as are conducted by the National Association of Audubon Societies, this paper is significant. It seems that Professor Stephen A. Forbes, Chief of the Natural History Survey Division of the Board of Natural Resources and Conservation of the State of Illinois, and an assistant,

Alfred O. Gross, made some intensive censuses of the bird life of three sections of the state of Illinois in the years 1906, 1907, 1908 and 1909. The results did not appear in print until October, 1923.

Inability to make a complete census of the birds of the state at any time being recognized, these men resorted to the method of random sampling. Their listing of methods used is as follows:

1. A careful selection of the sample tracts surveyed, with a view to making them as nearly as possible fairly representative of the whole area from which they were chosen. [Our method of enumeration limited us to birds of more or less open country, excluding us from aquatic situations and from dense forests or lofty trees.]

2. The accurate recognition and complete enumeration by two observers of all the birds present on long strips or belts of uniform width, one ob-

\*Bulletin of the State of Illinois, Department of Registration and Education, Division of the Natural History Survey. Vol. XIV, Article X, October, 1923, pp. 395-453.



server recognizing and counting the birds seen on each kind of habitat, and the other recording the distances traveled over each. [To make sure that practically all the birds were seen by these observers, several trial trips were made with a third person walking between and some distance behind the two; with the result that the number of additional birds thus flushed was altogether negligible.]

3. The form of field notes written on uniform slips day by day for each trip, the slips being numbered consecutively for convenient reference.

4. The method of tabulation of the observations in a way to make them available for consolidation in various ways and for complete discussion.

5. A species index of the numbered notes such that all the data for each species may be readily assembled.

6. The grouping and tabulation of "residence classes."

7. Use of the tables thus formed in comparing the composition of the bird population in different seasons and especially in different stages of the fall and spring migrations, and the tracing in detail by this means of the successive steps of each migration.

As one glances over the numerous tables, which by the way are not numbered, it is to be noted that emphasis is placed upon the numbers of birds per square mile. Many furnish an array of percentages and ratios. Practically all of the tables show subdivisions, indicating the three sections of the state, southern, central, and northern.

Confirmatory evidence that resident species diminish rapidly to the northward is given. The southern part of the state shows 82.9 per cent; the central, 64.3 per cent; and the northern, 57.2 per cent. Percentages for the winter visitants are practically the same, whereas the summer visitants increase in numbers northward according to the following percentages: 00 per cent; 14.3 per cent; 19 per cent. At the end of the paper ten and one-half pages are devoted to a general list of 195 species arranged according to their residence and their seasonal presence in the three sections of the state. A sample of the field notes, index cards and the percentage tables made from them follows.

Admitting the value of such statistical data, the reviewer has not been favorably impressed with the presentation, for it appears that even to one familiar with reports of this kind, the data are rather mixed and it is difficult to pick out the outstanding findings of the authors. The treatment of the methods used in the survey is to be found thirty-eight pages away from the introduction. Whereas most tables give the common names of birds, one important table, dealing with the more abundant birds found in various habitats, lists them only by A. O. U. numbers. It takes considerable "digging" to locate comparative tables for the various sections of the state and no summary is available to determine the authors' success in demonstrating what they set

out to show.—HAROLD C. BRYANT, *Berkeley, California, April 23, 1924.*

## MINUTES OF COOPER CLUB MEETINGS

### SOUTHERN DIVISION

**MARCH.**—The regular meeting of the Cooper Ornithological Club, Southern Division, was held at the Los Angeles Museum, Thursday evening, March 27, 1924. President Wyman was in the chair and the following members were present: Mesdames Ellis and Law; Miss Potter; Messrs. Barnes, Bishop, Campbell, Dawson, Law, Nokes, Rich and Wyman. Visitors were Mesdames Bishop and Wyman; Messrs. Baldock, Goldfrank, Short and Short.

Minutes of the February meeting were read and approved, followed by the February minutes of the Northern Division. The following names were presented for membership: Henry Boardman Conover, 6 Scott St., Chicago, by W. Lee Chambers; Craig R. Duer, Newberg, Oregon, by Stanley G. Jewett; Harry Warren Dunkelberger, Box 6, Flourtown, Montgomery Co., Pa., by W. Lee Chambers; A. T. Gausebeck, 60 Broadway, New York, by W. Lee Chambers; Stephen S. Gregory, Jr., 345 Barry Ave., Chicago, by Donald R. Dickey; Anna H. L. Holden, 2835 Divisadero St., San Francisco, by H. C. Bryant; Elmer L. Knapp, Route 2, Troy, Pa., by W. Lee Chambers; L. R. Orton, Fillmore, by L. G. Peyton; Colin Campbell Sanborn, Field Museum of Natural History, Chicago, by Henry K. Coale; Manfred Kenwood Spaulding, Box 984, Westwood, by W. Lee Chambers; John Le Moyne Stafford, Box 128, Gresham, Oregon, by W. Lee Chambers; James Douglas Turnbull, 2065 48th Ave. West, Vancouver, B. C., by W. Lee Chambers; Geo. C. Withey, Deering, North Dakota, by Geo. W. Morse. The Northern Division sent the names of E. Raymond Hall, Berkeley; Hildegard Howard, Los Angeles; Cavendish Moxon, Los Altos.

A letter to Mr. Wyman from Mr. Ralph Hoffmann was read, again inviting the Club to hold a meeting this spring at the Santa Barbara Museum of Natural History. Upon motion of Mr. Law, seconded by Dr. Rich, it was voted to accept Mr. Hoffmann's invitation for the last Saturday evening in June.

Mr. Wyman was also in receipt of a communication from the Board of Park Commissioners stating that the Board ex-



pects to request an appropriation of \$1500 in the budget of the department for the coming fiscal year for the purpose of establishing a bird sanctuary in Vermont Canyon at Griffith Park.

A proposal was made by Mr. Law, which met with instant approval, that the Club invite the American Ornithologists' Union to hold its 1925 meeting in Los Angeles. After some discussion it was decided to let the matter rest until next month's meeting before taking any action.

Dr. Bishop then presented two papers. Under the heading "*Larus hutchinsi*," he brought forth some interesting points in age plumage of various gulls. His "Notes on Some California Land Birds," comprised personal observations made by Dr. Bishop since his residence in California.

Mr. Law announced that he has been making a census of birds banded in the West during the past year, from March first to March first, and plans to make this an annual feature, publishing the result in THE CONDOR. This year's census shows 2105 birds of 78 species banded in this territory. Adjourned.—ELLA H. ELLIS, Secretary.

APRIL.—The Cooper Ornithological Club, Southern Division, held its regular monthly meeting Thursday evening, April 24, 1924, at the Los Angeles Museum, Exposition Park, with President Wyman in the chair and the following members present: Mesdames Barnes, Ellis, Law, Robertson, Schneider and Warmer; Messrs. Barnes, Bishop, Campbell, Cantwell, Chambers, Holland, Law, Pierce, Reis, Robertson, Widmann and Wyman. Visitors included Mesdames Bishop and Reis.

Minutes of the March meeting were read and approved. The March minutes of the Northern Division were read. Names presented for membership were: Walter Bruce, 813 Lincoln Place, Spokane, Wash., by J. L. Sloanaker; Taylor H. Halleck, Newport, Oregon, by W. Lee Chambers; David Daniel Keck, Smiley Hall, Claremont, by Wright M. Pierce; Henry Vining Ogden, 101 Wisconsin Street, Milwaukee, Wis., by W. Lee Chambers; Ernest Glenn Osborne, 161 W. 6th Street, Claremont, by Wright M. Pierce; Mrs. J. M. Sharples, Juneau, Alaska, by George Willett; Morton Stuart, U. S. Forest Service, Santa Barbara, by W. Lee Chambers; E. L. Sumner, Jr., 1343 S. Palomares Street, Pomona, by W.

Lee Chambers; Ralph C. Tate, Kenton, Okla., by W. Lee Chambers.

The question of inviting the American Ornithologists' Union, as suggested by Mr. Law at last month's meeting, to hold its 1925 session in Los Angeles, was brought up and discussed. On motion of Mr. Law, seconded by Mr. Pierce, it was voted unanimously that such invitation be extended, leaving the time of meeting to the pleasure of the A. O. U.

The "international crow shooting contest," which is being fostered by the Du Pont magazine and others, caused some discussion. Dr. Bishop moved that the Southern Division endorse the resolution protesting against this contest, as set forth in the March minutes of the Northern Division. This was seconded by Mr. Pierce and unanimously carried.

Mr. Wyman announced that he had received a call from a representative of Roy Chapman Andrews, leader of the Third Asiatic Expedition of the American Museum of Natural History. Mr. Andrews is to give a talk in Los Angeles early in June, notices of which will be sent to Cooper Club members.

Dr. Bishop suggested that it might be well that the resolution adopted by the Northern Division recommending the establishment of a National Monument at Glacier Bay, Alaska, be also endorsed by the Southern Division. His motion to that effect was seconded by Mr. Reis and carried.

An unusual number of Ferruginous Rough-legs was noted by Mr. Roland Ross on a recent trip through the interior of the state. Mr. Ross discussed and gave imitations of the calls of the Spotted Owl.

The Knot was reported by Mrs. Schneider as having been seen within the past few days near Playa del Rey. This is a rare occurrence in the spring, there being but two previous records of the Knot at this season of the year.

Dr. Bishop and Mr. Pierce gave some of their observations on recent trips to the Mohave desert.

Mr. Law moved that the chair appoint a committee of three to aid in collecting data on local migration. He believes that there are enough good observers in Southern California who are taking accurate migration notes to warrant an effort to tabulate the time of appearance at the different stations, in the hope that some reliable information on the direction of migration may be obtained. His motion being seconded by Dr. Bishop and

duly carried, Mr. Wyman appointed Miss Potter, Mr. Pierce and Mr. Law as such committee, Mr. Law to act as chairman. Adjourned.—ELLA H. ELLIS, *Secretary*.

#### NORTHERN DIVISION

APRIL.—The regular monthly meeting of the Cooper Ornithological Club, Northern Division, was held at the Museum of Vertebrate Zoology on April 24, 1924, at 8 P. M. The Secretary called the meeting to order. In the absence of the President and Vice-president, Dr. Evermann was elected chairman.

The following members were present: Misses Beaman, Burk, Fisher, Howard and Rush; Mesdames Allen, Bogle, Delpoit, Grinnell and Mead; Messrs. Borell, Clabaugh, English, Evermann, Grinnell, Hall, Lastreto, Miller, Simpson, Swarth and Trost. Three visitors were present.

Minutes of the March meeting were read and approved. Minutes of the Southern Division for March were read.

A letter from Mr. Arno B. Cammerer, Acting Director of National Parks, was read announcing the temporary withdrawal from settlement and homestead entry of lands bordering on Glacier Bay, Alaska, in order that the officials of the department might conduct an investigation as to the advisability of including a part or the whole of the area in a National Monument.

Dr. Evermann then introduced the speaker of the evening, Dr. Robert C. Miller, who spoke most interestingly upon the subject of "Birds and Gliders." Dr. Miller traced the course of experimentation from 1867, when a French scientist, inspired by the flight-powers of the albatross, prepared his first glider, to the inventors of today, whose creations are guided for several hours through the air before seeking earth. An excellent series of diagrams and tables and photographs of gliders and soaring gulls was thrown upon the screen to illustrate Dr. Miller's talk.

At the close of the program Mr. C. B. Lastreto brought the attention of the Club to the fact that, of all bills now before the House of Representatives aiming to control the pollution of our waters by oil, the only one which adequately meets the situation is the Willis Bill. Upon motion by Mr. Lastreto, seconded by Mr. English, the Northern Division unanimously adopted the following set of resolutions:

WHEREAS, it is known from personal observation and reliable report that pollution of our rivers, inland and ocean waters, principally by oil,

originates not only from vessels, but largely also from sources on shore, through indifference or through preventable accidents, such as at shipping yards, dry docks, gas factories, garages, railroad yards, industrial plants, refineries, storage and loading stations, also from leaks in pipe-lines and waste and over-flow at wells seeping into the ground and eventually being washed into waterways; and

WHEREAS, such pollutions have caused and are causing regrettable destruction of game and economically useful and other desirable birds, as well as harm to marine life and food supply, and also creating fire risks and disfiguring our waterfronts; and

WHEREAS, the Willis Bill, Senate No. 1942, has passed the Senate and aims to control pollution from land sources, as well as from floating craft, while other House and Senate bills offer but incomplete, inadequate and unsatisfactory remedies, omitting many very important and more practically remediable sources on shore; therefore, be it

RESOLVED, that the Cooper Ornithological Club, Northern Division, endorses the Willis Bill, Senate No. 1942, and urges its passage upon the Californian representatives in Congress, and urges the killing of other bills pending, that limit their scope to the regulation of floating craft alone.

Following the adoption of the above resolutions several members spoke upon the damage done to other than avian life by the oil film: clams, crustaceans, fishes and plankton suffering severely. Adjourned.—HILDA W. GRINNELL, *Secretary*.

MAY.—The regular monthly meeting of the Cooper Ornithological Club, Northern Division, was held at the Museum of Vertebrate Zoology on May 22, 1924, at 8 P. M. In the absence of the President and Vice-president, the Secretary called the meeting to order, and Dr. Evermann was elected Chairman of the evening.

The following members were present: Misses Beaman, Burk, Fisher, Paroni and Thomson; Mesdames Bamford, Bogle, Buhn, Davenport, Delpoit, Grinnell, Kibbe, Mead, Mexia, Schenck and Schlesinger; Messrs. C. A. Bryant, H. C. Bryant, Bunker, Carriger, Clabaugh, Cooper, Elmore, English, Evermann, W. Grinnell, Kibbe, La Jeunesse, Miller, Schenck, Simpson, Tenney and Torrey. Visitors were: Miss Rinder; Mesdames Bunker, Cooper, Evermann, Jessen, Marshall, Perry, Rinder, Sheldon and Tenney; Messrs. Edtl, Kierulff, Marshall, Perry, Tenney and Whitney.

Minutes of the April meeting were read and approved. Minutes of the Southern Division for April were read.

The following resolution was introduced and unanimously adopted:

WHEREAS, the Southern Division of the Cooper Ornithological Club at its meeting held on April 24, 1924, at Los Angeles invited the American Ornithologists' Union to hold its 1925 session in Los Angeles; therefore be it

RESOLVED, that the Northern Division of the Cooper Ornithological Club heartily approves and seconds the invitation of the Southern Division to the American Ornithologists' Union to hold its 1925 meeting in Los Angeles at such time as best fits its convenience.

The evening's business being concluded, Professor Tracy I. Storer spoke upon "Birds of the Yosemite." His graphic talk and the excellent slides which illustrated it gave a double pleasure to his audience. Adjourned.—HILDA W. GRINNELL, Secretary.

## DIRECTORY OF MEMBERS OF THE COOPER ORNITHOLOGICAL CLUB

Revised to June 1, 1924

### OFFICERS

#### NORTHERN DIVISION

Joseph Dixon, President  
C. B. Lastreto, Vice-President  
Mrs. Hilda Wood Grinnell, Secretary

#### SOUTHERN DIVISION

L. E. Wyman, President  
Dr. Louis B. Bishop, Vice-President  
Mrs. Ella Haines Ellis, Secretary

### EDITORS

Joseph Grinnell  
Harry S. Swarth

### BUSINESS MANAGERS

J. Eugene Law  
W. Lee Chambers

### ENDOWMENT SECRETARY

Donald R. Dickey

The above officers, together with the following ex-presidents (not included above, all those whose membership has been continuous since incumbency), constitute the Board of Governors of the Club.

Ralph Arnold, Harold C. Bryant, Henry W. Carriger, Herbert L. Coggins, J. S. Cooper, Barton Warren Evermann, Walter K. Fisher, Oza W. Howard, W. B. Judson, Joseph Mailliard, Loye H. Miller, G. Frean Morcom, Wilfred H. Osgood, Wright M. Pierce, Guy C. Rich, Howard Robertson, Tracy I. Storer, Curtis Wright.

### MEMBERS

In the following roster, residence is understood to be in California unless otherwise indicated. Year following address indicates date that member joined the Club; year in parenthesis indicates date member became honorary or life member. Star (\*) preceding indicates life member; § indicates contributor to Endowment Fund.

#### HONORARY MEMBERS

\*§Bailey, Florence M. (Mrs. Vernon), 1834 Kalorama Road, Washington, D. C. 1910 (1920) (1920).  
Fisher, Dr. A. K., Biol. Survey, Washington, D. C. 1904 (1924).  
Henshaw, Henry W., Biol. Survey, Washington, D. C. 1909.  
Merriam, Dr. C. Hart, 1919 16th St., Washington, D. C. 1909.  
\*§Morcom, G. Frean, 243 N. Coronado St., Los Angeles. 1904 (1915) (1922).

Nelson, Dr. E. W., Biol. Survey, Washington, D. C. 1904 (1917).  
Ridgway, Robert, Route 7, Olney, Ill. 1905.  
§Stephens, Frank, Natural History Museum, Balboa Park, San Diego. 1894 (1912).

#### ACTIVE MEMBERS

Abbott, Clinton G., Nat. Hist. Museum, Balboa Park, San Diego. 1921.  
Abernathy, Frieda (Mrs. St. E.), 1726 Virginia St., Berkeley. 1914.  
Adams, Benjamin, Wethersfield, Conn. 1920.  
Adams, Frank O., Canfield, West Vancouver, B. C. 1922.  
Adams, Miss Romola M., 912 Linden Ave., Long Beach. 1921.  
Aitken, Drummond, 766 Milwaukee St., Denver, Colorado. 1924.  
\*Alexander, Miss Annie M., Suisun. 1908 (1923).  
Allen, Dr. Arthur A., McGraw Hall, Ithaca, N. Y. 1911.  
Allen, Mrs. Amelia S., 37 Mosswood Road, Berkeley. 1913.  
Allen, Walter I., Lamanda Park. 1922.  
Anderson, Mrs. Malcom P., care of Merrill Palmer School, 71 East Ferry St., Detroit, Mich. 1920.  
Anderson, Dr. Rudolph M., Biol. Div., Victoria Memorial Museum, Ottawa, Ont., Canada. 1916.  
Anthony, A. W., Nat. Hist. Museum, Balboa Park, San Diego. 1921.  
Anthony, Mrs. Joseph, 1208 Fuller Ave., Hollywood. 1922.  
Applegate, Elmer I., Klamath Falls, Ore. 1921.  
\*Appleton, J. S., 1332 Citrus Ave., Hollywood. 1901 (1919).  
Archer, Ethel M., Garden Grove. 1923.  
Armstrong, Edward E., 2249 Calumet Ave., Chicago, Ill. 1914.  
Arnold, E., Grand Trunk Ry., Montreal, Que., Canada. 1909.  
Arnold, Mrs. Lewis, 2732 Benvenue Ave., Berkeley. 1921.  
Arnold, Dr. Ralph, 639 S. Spring St., Los Angeles. 1893.  
Atkinson, W. L., 35 Hawthorne Way, San Jose. 1901.  
Atsatt, Miss Sarah R., 345 S. Serrano Ave., Los Angeles. 1911.  
Austin, Miss Dorothy K., 85 S. Madison Ave., Pasadena. 1921.  
Averill, Charles Ketchum, 1075 Iranistan Ave., Bridgeport, Conn. 1922.  
Bacon, Frank, 2231 Piedmont Ave., Berkeley. 1922.  
Badé, Dr. Wm. F., 2616 College Ave., Berkeley. 1903.  
Badger, M. C., Santa Paula. 1915.  
Bailey, Alfred M., Colo. Museum Nat. Hist., Denver, Colo. 1917.  
Bailey, Bernard, R.D. 1, Elk River, Minn. 1911.  
Bailey, H. H., Box 5, Miami Beach, Miami, Fla. 1903.

- Bailey, Vernon, 1834 Kalorama Road, Washington, D. C. 1904.
- Baker, Chas. H., 594 13th St., Oakland. 1921.
- Baker, Milo S., Kenwood. 1923.
- \*§Baldwin, S. P., 11025 East Boulevard, Cleveland, Ohio. 1920 (1920).
- §Bales, Dr. B. R., 149 W. Main St., Circleville, Ohio. 1906.
- Ball, Wm. H., Eureka. 1922.
- Ballard, Mrs. Maria V., 295 12th St., Portland, Ore. 1919.
- Bamford, Mrs. G. L., 1428 Castro St., Oakland. 1918.
- Bancroft, Griffing, 2525 First St., San Diego. 1920.
- §Bangs, Outram, Museum Comp. Zool., Cambridge, Mass. 1906.
- Barker, Fred, Parkers Prairie, Minn. 1914.
- Barnes, C. A., 1815 S. Western Ave., Los Angeles. 1921.
- Barnes, Claude T., 359 10th Ave., Salt Lake City, Utah. 1915.
- Barnes, Frances V., 1815 S. Western Ave., Los Angeles. 1921.
- \*§Barnes, R. Magoon, Lacon, Ill. 1908 (1921).
- Bartlett, Mrs. Adelaide R., Assessors Office, City Hall, San Francisco. 1922.
- Bassett, F. N., 1338 8th St., Alameda. 1919.
- Batchelder, Chas. F., 7 Kirkland St., Cambridge, Mass. 1910.
- Bates, Josephine J., 1267 Sunset Ave., Pasadena. 1921.
- Battles, Carroll David, Superior, Ariz. 1924.
- Baxter, Philip Norman, 159 Churchill Ave., Palo Alto. 1924.
- Beaman, Miss Susan, Cora L. Williams Institute, Berkeley. 1923.
- Beattie, S. H., Tubac, Ariz. 1924.
- \*§Beck, Rollo H., R.D. 21, San Jose. 1894 (1919).
- Beers, Miss Catherine V., Univ. Southern Calif., Los Angeles. 1921.
- Bell, B. C., 235 8th St., San Francisco. 1919.
- Benjamin, Elbert, 109 Coral St., Los Angeles. 1920.
- Bennet, Eleanor V. V., 2904 Piedmont Ave., Berkeley. 1920.
- Bennett, R. H., 216 Market St., San Francisco. 1909.
- \*Bent, A. C., 140 High St., Taunton, Mass. 1909 (1922).
- Benton, Thomas H., Jr., 2136 San Jose Ave., Alameda. 1916.
- Bergtold, Dr. W. H., 1159 Race St., Denver, Colo. 1917.
- Betterley, Bertram O., 2005 2nd St., Eureka. 1922.
- Bicknell, Mrs. F. T., 319 S. Normandie Ave., Los Angeles. 1913.
- Bigelow, Homer L., 37 Old Orchard Road, Chestnut Hill, Mass. 1910.
- \*Bishop, Dr. Louis B., 356 Orange St., New Haven, Conn. 1904 (1920).
- Blake, Mrs. Edwin T., R.F.D. 1, Box 34, Berkeley. 1917.
- Blayne, Nita A., 920 O St., Fresno. 1911.
- Blickensderfer, Clark, 850 Grant St., Denver, Colo. 1922.
- Bliss, Leslie Edgar, R.F.D. 3, Box 158-A, Pasadena. 1923.
- Bliss, John D., Pozo, San Luis Obispo Co. 1916.
- Boardman, Margaret W., 1239 W. 11th St., Los Angeles. 1922.
- Boeing, W. E., The Highlands, R.D. 2, Seattle, Wash. 1914.
- Bogle, Mrs. Sara S., 2951 Linden Ave., Berkeley. 1921.
- Bolander, L. Ph., Jr., 1947 E. 28th St., Oakland. 1907.
- Bolt, B. F., 1421 Prospect Ave., Kansas City, Mo. 1916.
- Borell, Adrey E., 2149 Blake St., Berkeley. 1918.
- Bourne, W. A., Box 27, Yosemite. 1923.
- Bowdish, B. S., Demarest, N. J. 1910.
- Bowles, J. H., The Woodstock, Tacoma, Wash. 1903.
- Boyle, Ashby D., 380 E St., Salt Lake City, Utah. 1915.
- Boyle, Miss Una, Calpella. 1921.
- \*§Bradbury, W. C., 1440 Race St., Denver, Colo. 1913 (1914).
- Braislin, Dr. William C., 425 Clinton Ave., Brooklyn, N. Y. 1910.
- Bramkamp, Richard, Banning. 1921.
- Brandt, H. W., 2025 E. 88th St., Cleveland, Ohio. 1914.
- \*Brooks, Allan, Okanagan Landing, B. C., Canada. 1906 (1920).
- Brooks, L., Box 539, New Bedford, Mass. 1913.
- Brooks, Winthrop Sprague, Boston Soc. Nat. Hist., 234 Berkeley St., Boston, Mass. 1923.
- Brown, D. E., 87 Lenora St., Seattle, Wash. 1909.
- \*Brown, Edward J., Box 99, Eustis, Lake County, Fla. 1915 (1919).
- Brown, Mrs. Herbert, 434 E. 2nd St., Tucson, Ariz. 1914.
- Brown, Nellie May, 354 North Ave. 53, Los Angeles. 1922.
- Brown, Mrs. Wm. Clark, 413 West 10th St., Dallas, Tex. 1921.
- Bruce, Miss Bess M., Glendora. 1924.
- Bruce, Walter, 813 Lincoln Place, Spokane, Wash. 1924.
- Bryan, William Alanson, Museum Hist., Sci., and Art, Los Angeles. 1921.
- Bryant, Dr. Carl H., Atascadero. 1922.
- Bryant, Chas. A., Room 1081 S. P. Bldg., 65 Market St., San Francisco. 1922.
- §Bryant, Dr. Harold C., Museum Vert. Zool., Berkeley. 1910.
- Buhn, Mrs. Minnie, 1025 Pearl St., Alameda. 1921.
- Bull, Daniel Bernard, R.D. A, Box 158, San Jose. 1919.
- Bunker, Paul F., 1151 Shattuck Ave., Berkeley. 1922.

- Burk, Genevieve S., 1601 Oxford St., Berkeley. 1920.
- Burleigh, Thos. D., Univ. Ga., Athens, Ga. 1918.
- Burnell, Miss Elizabeth, 1029 Spaulding Ave., Los Angeles. 1921.
- Burnett, W. L., State Agr. Coll., Fort Collins, Colo. 1910.
- Burnham, Dr. Clark, 835 Arlington Road, Berkeley. 1907.
- Burnham, John, Timken Bldg., San Diego. 1920.
- Burns, Frank L., Berwyn, Pa. 1909.
- Burns, James R., 645 44th St., Des Moines, Ia. 1922.
- Burtch, Verdi, Branchport, N. Y. 1910.
- Cahn, Alvin R., 1117 W. Nevada St., Urbana, Ill. 1922.
- Calder, James A., Buena Park. 1917.
- Camp, Dr. Chas. L., Bacon Hall, Univ. Calif., Berkeley. 1909.
- Campbell, R. A., R. R. Box 188, Burbank. 1922.
- Canby, Caroline P., San Fernando. 1921.
- Canfield, Mrs. May, 2875 Clay Ave., San Diego. 1922.
- Cantelow, Mrs. E. D., Hotel Whitcomb, San Francisco. 1923.
- Cantelow, H. C., Hotel Whitcomb, San Francisco. 1923.
- Cantwell, George G., 7237 Keystone Ave., Palms. 1915.
- Carpenter, George I., 746 Lincoln Place, Brooklyn, N. Y. 1920.
- Carpenter, N. K., 3775 Kite St., San Diego. 1901.
- Carriger, H. W., 5185 Trask St., Oakland. 1895.
- Case, Rev. B. F., New Smyrna, Fla. 1913.
- Case, C. M., 306 Blue Hills Ave., Hartford, Conn. 1911.
- §Chamberlain, C. W., 36 Lincoln St., Boston, Mass. 1912.
- \*Chambers, W. Lee, Eagle Rock. 1897 (1919).
- Chaney, Dr. Ralph W., 2611 Keith Ave., Berkeley. 1923.
- Chapman, Dr. Frank M., Amer. Museum Nat. Hist., New York, N. Y. 1903.
- Cheesman, M. R., 1328 Gower St., Hollywood. 1919.
- Cheney, E. S., 1838 4th Ave., Oakland. 1920.
- Cheney, Miss Mary, 48 Hartford Road, So. Manchester, Conn. 1919.
- §Clabaugh, E. D., 2215 Grant St., Berkeley. 1923.
- Clark, Josiah H., 702 E. 23rd St., Paterson, N. J. 1910.
- Clay, C. Irvin, Box 353, Eureka. 1910.
- Cleaves, Howard H., 129 Moffat Road, Waban, Mass. 1921.
- Clough, Miss M. Pamela, 844 Arlington Road, Berkeley. 1923.
- Coale, Henry K., Highland Park, Ill. 1907.
- Coffin, Robert L., Mass. Agr. Exp. Station, Amherst, Mass. 1920.
- Coggins, Herbert L., 2929 Piedmont Ave., Berkeley. 1910.
- Cohen, Donald A., 2618 Lincoln St., Alameda. 1901.
- Cohn, Mrs. Effie C., Key Route Inn, Oakland. 1923.
- \*§Colburn, A. E., 806 S. Broadway, Los Angeles. 1905 (1915).
- Cole, Mrs. Arthur H., Hotel Whitecotton, Berkeley. 1917.
- Cole, F. R., Route A., Box 177, Redlands. 1922.
- Cole, John L., R.D. 5, Nevada, Ia. 1922.
- Compton, Mary J. (Mrs. C. Norman), 6510 1st St. N. E., Seattle, Wash. 1920.
- Comstock, Dr. John, Southwest Museum, Los Angeles. 1920.
- §Conover, H. B., 6 Scott St., Chicago, Ill. 1924.
- Cook, Fred'k W., 1604 E. Harrison St., Seattle, Wash. 1919.
- Cook, Miss Inez, Glendora. 1924.
- Cooke, Miss M. T., 1328 12th St., Washington, D. C. 1918.
- Cookman, Alfred, 336 W. Pioneer Drive, Glendale. 1912.
- Coolidge, Karl R., Box 12, Hollywood. 1922.
- Cooper, J. S., 310 Howard Ave., Piedmont. 1903.
- Cope, Francis R., Jr., Dimock, Penn. 1919.
- Coppee, Marie P., Ross, Marin Co. 1921.
- Cordier, A. H., 415 Benton Boulevard, Kansas City, Mo. 1924.
- Cozens, Harold H., 1631 Posen Ave., Berkeley. 1921.
- Craven, Jesse T., 8935 Colfax St., Detroit, Mich. 1909.
- Craig, Agnes Somerville, 1221 Summit Ave., Pasadena. 1923.
- Creager, Marvin H., 634 The Alameda, Berkeley. 1923.
- Crockett, Harry L., 948 12th St., Douglas, Ariz. 1924.
- Crosby, Maunsell S., Grasmere Farms, Rhinebeck, N. Y. 1911.
- Crow, Mrs. G. Maurice, Glendora. 1923.
- Crum, Ethel, Box 92, Concord. 1920.
- Culver, Geo. B., Stanford University. 1921.
- Culver, Susan B., 2423 Prospect St., Berkeley. 1914.
- Cummings, Byron, Univ. Ariz., Tucson, Ariz. 1916.
- Cunningham, Walter, 3009 Dunham Ave., Kansas City, Mo. 1921.
- Currier, Ed. S., 416 E. Chicago St., St. Johns Sta., Portland, Ore. 1904.
- Davenport, Mrs. Elizabeth B., Northern Ave., Brattleboro, Vt. 1911.
- Davenport, Mrs. W. S., 2730 Stuart St., Berkeley. 1922.
- Davies, A. E., 1327 Grove St., Berkeley. 1920.
- Davis, Dr. Fred B., 220 Grand Ave., Oakland. 1916.
- Davis, Henry W., 10 S. Baton Rouge Ave., Atlantic City, N. J. 1922.
- Davis, John M., 737 M St., Eureka. 1908.
- \*Dawson, W. Leon, R.D. 3, Box 83, Santa Barbara. 1906 (1915).
- Deane, Ruthven, 112 W. Adams St., Chicago, Ill. 1904.



- Deane, Walter, 29 Brewster St., Cambridge, Mass. 1907.
- Dearborn, Dr. Ned, Sackett Harbor, N. Y. 1909.
- Decker, F. R., Kiona, Wash. 1913.
- DeGroot, Dudley S., Normal Hill Center, Los Angeles. 1916.
- De Laubenfels, Max Walker, 620 19th St., Huntington Beach. 1921.
- Delport, Mrs. Mary E., 1601 Oxford St., Berkeley. 1923.
- Deweese, Miss Elizabeth, Whitehead Rd. and Marshall St., Norristown, Pa. 1922.
- Dice, Dr. Lee R., Museum of Zoology, Ann Arbor, Mich. 1914.
- Dickens, Charles, Key Route Inn, Oakland. 1923.
- Dickenson, A. B., R.D. 1, Box 11B, San Gabriel. 1916.
- Dickenson, Mrs. A. B., R.D. 1, Box 11B, San Gabriel. 1919.
- \*Dickey, Donald R., 514 Lester Ave., Pasadena. 1910.
- Dickey, Mrs. Florence V. V., 514 Lester Ave., Pasadena. 1923.
- Dille, F. M., Valentine, Neb. 1903.
- Dings, G. M., 2161 Ry. Exch. Bldg., St. Louis, Mo. 1920.
- Dixon, James Benjamin, Escondido. 1924.
- Dixon, Joseph, Museum Vert. Zool., Berkeley. 1904.
- Dodge, Laura I., 3031 Eliot St., Long Beach. 1915.
- Dodge, Ralph E., R.D. 9, Box 468, Exeter. 1915.
- Doolittle, E. A., Box 44, Painesville, Ohio. 1918.
- Drachman, Myra, 3031 Eliot St., Long Beach. 1915.
- DuBois, Alexander Dawes, 327 S. Glenwood Ave., Springfield, Ill. 1911.
- Duer, Craig R., Newberg, Ore. 1924.
- Dunkelberger, Harry Warren, Flouertown, Montgomery Co., Pa. 1924.
- Duprey, H. F., 2056 23rd Ave., Oakland. 1907.
- Durfee, Owen, 727 Madison St., Fall River, Mass. 1911.
- Dutton, P. C., 65 High St., Stone Staffs, England. 1913.
- Dwight, Dr. Jonathan, Jr., 43 W. 70th St., New York, N. Y. 1904.
- Dyke, Mrs. Estelle D., 405 E. Stocker St., Glendale. 1923.
- Dyson, James Seabrook, Teglarson Ranch, Alexis Creek, Chilcotin, B. C., Canada. 1924.
- Easton, Mrs. Jane F., Torrey Road, La Jolla. 1920.
- Eaton, S. Harrison, Box 653, Lawrenceville, Ill. 1916.
- Edson, J. M., Marietta Road, Bellingham, Wash. 1911.
- \*Eggleston, Prof. Julius W., 657 Lemon St., Riverside. 1913 (1919).
- Elmore, Louis A., 2023 Delaware St., Berkeley. 1920.
- Ellis, Mrs. Ella Haines, 910 Grattan St., Los Angeles. 1922.
- Ellis, Ralph, 2420 Ridge Road, Berkeley. 1923.
- Ellis, Ralph, Jr., 2420 Ridge Road, Berkeley. 1923.
- Eliot, Willard Ayres, 1011 Thurman St., Portland, Ore. 1923.
- \*Emerson, W. Otto, Palm Cottage, Hayward. 1920 (1921).
- English, Thomas A., 2001 Haste St., Berkeley. 1923.
- Enochs, Rex P., 1156 So. Hope St., Los Angeles. 1921.
- Esterly, Dr. C. O., Occidental College, Los Angeles. 1908.
- Evans, Ella A., Exeter. 1922.
- Evans, Frank C., Crawfordsville, Ind. 1918.
- Evans, J. Harold, R.D. 4, Box 500, Santa Rosa. 1917.
- Evans, Wm. V., Livingston, Mont. 1920.
- Evermann, Dr. Barton W., Cal. Acad. Sciences, San Francisco. 1911.
- Fargo, Mrs. Minerva J., 1632 N. Kingsley Drive, Los Angeles. 1914.
- Farley, Frank La Grange, Camrose, Alberta, Canada. 1923.
- Felger, A. H., North Side High School, Denver, Colo. 1920.
- Felton, Mrs. C. N., 216 Pine St., San Francisco. 1916.
- \*Ferguson, Mrs. Aurelia B., 999 Gramercy Drive, Los Angeles. 1922.
- Ferguson, Mrs. Mary Van E., 1 Orchard Lane, Berkeley. 1915.
- Ferriss, James H., West Park, Joliet, Ill. 1923.
- Field, Clyde, 1859 Julian Ave., San Diego. 1919.
- Finley, Wm. L., Jennings Lodge, Ore. 1900.
- Fisher, Miss Edna M., 2410 Fulton St., Berkeley. 1923.
- Fisher, Miss Elizabeth W., 2222 Spruce St., Philadelphia, Pa. 1910.
- Fisher, Prof. Walter K., Stanford Marine Laboratory, Pacific Grove. 1900.
- Fleming, J. H., 267 Rusholme Road, Toronto, Ont., Canada. 1910.
- Fletcher, L. B., 54 Cotswald Road, Brookline, Mass. 1922.
- Fletcher, Lyle R., 1202 Kentucky St., Lawrence, Kan. 1920.
- Flinn, Catherine Mills, 1799 University Ave., Berkeley. 1920.
- Floyd, Charles Benton, 454 Wolcott St., Auburndale, Mass. 1922.
- Flynn, Helen, 1546 Shattuck Ave., Berkeley. 1920.
- Forbush, E. H., State House, Boston, Mass. 1916.
- Forrest, Earle R., 205 N. Main St., Washington, Pa. 1910.
- Fortiner, John C., Box 496, Brawley. 1910.
- Fowler, Frederick H., 221 Kingsley Ave., Palo Alto. 1901.
- Frank, Arthur W., Wash. Exp. Sta., Puyallup, Wash. 1920.
- Frazer, J. Thomas, Jr., 432 W. Hawthorne St., Eureka. 1920.



- Frederick, Mrs. Adeline, 1201 Henry St., Berkeley, 1922.
- French, Mrs. A. J., Carlton, Ore., 1921.
- French, James G., The Menagerie, 3628 Saanich Road, Victoria, B. C., Canada. 1918.
- Frost, Henry, 475 29th St., San Francisco. 1924.
- Frye, Prof. T. C., Univ. Wash., Seattle, Wash. 1919.
- Fuertes, Louis A., 201 Wyckoff Ave., Ithaca, N. Y. 1904.
- Gabrielson, Ira N., 515 P. O. Bldg., Portland, Ore. 1919.
- Gallup, Frederick Norman, Escondido. 1921.
- Gamble, Hamilton, 476 8th Ave., San Francisco. 1922.
- Ganier, Albert F., 2507 Ashwood Ave., Nashville, Tenn. 1921.
- Garber, Miss Lida J., 15 Tanglewood Road, Berkeley. 1923.
- Gartrell, Geo. N., Summerland, B. C., Canada. 1917.
- Gault, Benj. T., 564 N. Main St., Glen Ellyn, DuPage Co., Ill. 1905.
- Gausebeck, A. T., 60 Broadway, New York City, N. Y. 1924.
- Gay, Harold S., 200 S. Wilson Ave., Alhambra. 1901.
- Geiselhart, Miss Josephine, Concord. 1920.
- Germain, Miss Claire, Balboa. 1915.
- Giannini, Chas. A., Poland, N. Y. 1919.
- Giddings, Levi A., 436 Douglas Ave. Salt Lake City, Utah. 1923.
- Gifford, Dr. Harold, 3636 Burt St., Omaha, Neb. 1916.
- Gignoux, Claude, 73 Tunnel Road, Berkeley. 1919.
- Gilchrist, Francis G., 2223 Parker St., Berkeley. 1920.
- Giles, Roscoe L., 82 Newton St., Marlborough, Mass. 1917.
- Gilman, M. French, Banning. 1901.
- Girvin, F. H., 5635 Melrose Ave., Los Angeles. 1919.
- Goelitz, Herman, 944 Alameda Drive, Portland, Ore. 1920.
- \*Goelitz, Walter A., 170 Nunda Blvd., Rochester, N. Y. 1915 (1920).
- Goethe, C. M., Capital Nat. Bank Bldg., Sacramento. 1915.
- Goldman, E. A., Biol. Survey, Washington, D. C. 1901.
- Goldman, Luther J., Biol. Survey, Boise, Idaho. 1902.
- Goodcell, Mrs. Marion L., 864 D St., San Bernardino. 1914.
- Grant, U. S., 4th, 639 S. Wilton Place, Los Angeles. 1909.
- Gregory, Stephen S., Jr., 345 Barry Ave., Chicago, Ill. 1924.
- Grey, Henry, R.D. 2, Box 154A San Diego. 1901.
- Griffie, Willet E., R.D. 3, Box 68, Corvallis, Ore. 1919.
- Grimes, Samuel A., R.R. No. 6, Box 391, Jacksonville, Fla. 1924.
- Grinnell, Dr. George Bird, 238 E. 15th St., New York, N. Y. 1914.
- \*Grinnell, Hilda Wood (Mrs. Joseph), 2811 College Ave., Berkeley. 1912 (1921).
- \*Grinnell, Prof. Joseph, Museum Vert. Zool., Berkeley. 1894 (1919).
- Grinnell, Willard Fordyce, 2811 College Ave., Berkeley. 1921.
- Gross, Prof. Alfred O., Bowdoin College, Brunswick, Maine. 1923.
- Guion, Geo. Seth, Napoleonville, La. 1911.
- Gunn, Miss Amy E., 600 Bush St., San Francisco. 1914.
- Gunthorp, Horace, Univ. Wash., Seattle, Wash. 1920.
- Guthrie, Miss Esther, 2201 H St., Sacramento. 1918.
- Hadeler, E. W., Painesville, Ohio. 1918.
- Hall, Mrs. Carlotta C., 1615 La Loma Ave., Berkeley. 1915.
- Hall, Mrs. C. H., 2141 N. Highland Ave., Los Angeles. 1921.
- Hall, E. Raymond, Museum Vert. Zool., Berkeley. 1924.
- Halladay, Daniel S., R.D. 3, Box 201, Anaheim. 1910.
- Halleck, Taylor H., Newport, Ore. 1923.
- Hallinen, J. E., Cooperton, Kiowa Co., Okla. 1921.
- Hampton, Mrs. Ethel C., 73 Leese St., San Francisco. 1914.
- Hanaford, A. W., R.D. 9, Box 1210, Los Angeles. 1917.
- Hands, Frank H., Dos Cabezas, Ariz. 1920.
- Hann, H. H., Parkdale, Ore. 1909.
- Hanna, Dr. G. Dallas, Cal. Acad. Sciences, San Francisco. 1921.
- \*Hanna, W. C., 141 East F St., Colton. 1902 (1921).
- Harding, Mrs. Harriet Squier, Forest Ranch, Butte Co. 1924.
- Harlow, Richard C., Colgate Univ., Hamilton, N. Y. 1919.
- Harper, Francis, Cornell Univ., Ithaca, N. Y. 1920.
- \*Harris, Harry, 18 W. 52d St., Kansas City, Mo. 1914 (1919).
- Harrison, H. M., 319 Penn St., Camden, N. J. 1920.
- Hart, Cecil, R.R. No. 1, Box 432, Montebello. 1920.
- Hartman, Paul J., 1118½ Maple Ave., Los Angeles. 1917.
- Hartung, Miss Esther, 124 Mill St., Grass Valley. 1923.
- Hathaway, H. S., Box 1466, Providence, R. I. 1912.
- Havemeyer, Henry O., Mahwah, N. J. 1917.
- Hayes, Mrs. F. M., Box 591, Davis. 1919.
- Haywood, J. F., Mather, Tuolumne Co. 1923.
- Head, Miss Anna, 2809 Forest Ave., Berkeley. 1912.
- Heath, Prof. Harold, 1147 Ramona St., Palo Alto. 1919.
- Hedges, Chas. F., Box 24, Miles City, Mont. 1919.

- Hegner, Carl D., 810 Avoca St., Los Angeles. 1914.
- Heineman, Oluf J., 1664 Grove St., San Francisco. 1908.
- Heller, Edmund, Field Museum Nat. Hist., Chicago, Ill. 1894.
- Helme, Arthur H., Miller Place, Suffolk Co., N. Y. 1911.
- Hendee, Russell W., Colorado Museum Nat. Hist., Denver, Colo. 1923.
- Henderson, A. D., Belvedere, Alberta, Canada. 1923.
- Henderson, H. N., 216 E. Philadelphia St., Whittier. 1923.
- Henderson, Dr. H. C., Casitas Road, Carpinteria. 1919.
- Henderson, Junius, 627 Pine St., Boulder, Colo. 1909.
- Henderson, Walter C., Biol. Survey, Washington, D. C. 1918.
- Hendren, Miss Elizabeth, Occidental. 1920.
- Henshaw, Judge F. W., 762 Mills Bldg., San Francisco. 1915.
- \*Hersey, F. Seymour, 6 Maple Ave., Taunton, Mass. 1915 (1920).
- Hill, Grace A., Camp Kearny Hospital, San Diego. 1922.
- Hill, H. R., 815 West 37th St., Los Angeles. 1922.
- Hill, Joseph J., Lafayette. 1923.
- Hill, Willard, Star Route, Wasco, Kern Co. 1918.
- Hilton, Dr. W. A., Claremont. 1921.
- Hoffman, Louis E., Box Cor. Benner and Shults St., Los Angeles. 1920.
- Hoffmann, Ralph, Carpinteria. 1920.
- Hohfeld, Mrs. Edward, 754 3d Ave., San Francisco. 1920.
- Holden, Anna H. L., 2835 Divisadero St., San Francisco. 1924.
- \*Holland, Harold M., Box 515, Galesburg, Ill. 1901 (1920).
- Hollister, N., Nat. Zool. Park, Washington, D. C. 1920.
- Holman, F. C., 1468 Greenwich St., San Francisco. 1914.
- \*Hoover, Prof. Theodore J., Box A, Stanford University. 1898 (1916).
- Horsfall, R. Bruce, R. 6, Box 80, Portland, Ore. 1914.
- Houghton, Clarence, 533 Washington Ave., Albany, N. Y. 1924.
- Houghton, John D., 152 Suffolk Road, Chestnut Hill, Mass. 1922.
- Howard, Hildegard, 2943 So. Harvard Blvd., Los Angeles. 1924.
- Howard, O. W., Box 484, Los Angeles. 1895.
- Howatt, Haven D., 1922 F St., Eureka. 1924.
- \*Howell, A. B., 770 S. Pasadena Ave., Pasadena. 1908 (1915).
- Howell, Arthur H., 2919 S. Dakota Ave., Washington, D. C. 1916.
- Howell, B. F., Jr., 52 Patton Ave., Princeton, N. J. 1909.
- Howes, Paul G., 46 Auldwood Road, Stamford, Conn. 1910.
- Huber, Wharton, Academy of Natural Sciences, 19th and Race Sts., Philadelphia, Pa. 1915.
- Hudson, L. W., 5407 Genoa St., Oakland. 1917.
- \*Huey, Laurence, Natural History Museum, Balboa Park, San Diego. 1909 (1921).
- Humphrey, Mary Brown, 2733 Benvenue Ave., Berkeley. 1924.
- Hunt, C. J., 5847 W. Superior St., Chicago, Ill. 1919.
- Hunt, Richard, 1931 Hearst Ave., Berkeley. 1918.
- Hunter, J. S., Box 482, San Mateo. 1903.
- Hurley, John B., 713 South 7th St., Yakima, Wash. 1921.
- Husher, Mrs. Gertrude H., 821 S. Hope St., Los Angeles. 1913.
- Hyde, Mrs. Silkman E., Regena, Idaho. 1922.
- Illingsworth, J. F., Univ. Hawaii, Honolulu, T. H. 1896.
- Ingersoll, Albert M., 908 F St., San Diego. 1895.
- Isham, C. Bradley, 909 Valley Road, Upper Montclair, N. J. 1909.
- Jackson, Dr. Hartley H. T., Biol. Survey, Washington, D. C. 1921.
- Jackson, Ralph W., R.D. 1, Cambridge, Md. 1917.
- Jacobs, J. Warren, 404 S. Washington St., Waynesburg, Pa. 1909.
- Jacobsen, W. C., 2319 M St., Sacramento. 1916.
- Jacot, Edward C., Box 462, Prescott, Ariz. 1923.
- Jaeger, Edmund C., 1462 W. 6th St., Riverside. 1922.
- Jay, Antonin, 1622 Pennsylvania Ave., Los Angeles. 1901.
- Jesurun, Dr. Mortimer, 802 American Ave., Long Beach. 1916.
- Jewett, Stanley G., 582 Bidwell Ave., Portland, Ore. 1909.
- Johnson, A. C., Whittier Nat. Bank, Whittier. 1919.
- Johnson, Miss Clare E., Room 151, City Hall, San Francisco. 1921.
- Johnson, H. H., Pittsfield, Me. 1920.
- Johnson, Henry W., 284 East Orange Grove Ave., Pasadena. 1924.
- Johnson, Dr. Myrtle E., National City. 1908.
- Jones, Dr. Lynds, Museum Oberlin Coll., Oberlin, Ohio. 1911.
- Jordan, A. H. B., Everett, Wash. 1911.
- Jordan, Dr. David Starr, Stanford University. 1902.
- Judson, W. B., 826 Washington Bldg., Los Angeles. 1894.
- Kaeding, Geo. L., 227 N. Central Ave., Glendale. 1903.
- Kalmbach, Edwin R., Biological Survey, Washington, D. C. 1923.
- Kaseberg, Mrs. Anna J., Hotel Victoria, Bush and Stockton Sts., San Francisco. 1924.
- Keck, David Daniel, Smiley Hall, Claremont. 1924.

- Keefer, Miss Mary Belle, 605 Wallace Ave., Covington, Ky. 1923.
- Keeler, Leonarde, 155 El Camino Real, Berkeley. 1922.
- Kell, Delacourt, Claremont. 1921.
- Kellogg, Miss Louise, Box 248, Suisun. 1911.
- Kellogg, Miss Mildred, 2232 Piedmont Ave., Berkeley. 1921.
- Kellogg, Ralph T., Silver City, N. M. 1916.
- Kellogg, Prof. Vernon L., Stanford University. 1901.
- Kelly, Junea W. (Mrs. G. E.), 1311 Grand St., Alameda. 1918.
- \*Kennard, Frederick H., Dudley Road, Newton Centre, Mass. 1911 (1916).
- Kennedy, Clarence H., Zool. Dept., Ohio State Univ., Columbus, Ohio. 1912.
- Kennedy, Miss Eveline, 5330 Pasadena Ave., Los Angeles. 1921.
- Keyes, Prof. Chas. R., Mt. Vernon, Iowa. 1900.
- Kibbe, A. S., 1534 Grove St., Berkeley. 1917.
- Kibbe, Bessie W. (Mrs. A. S.), 1534 Grove St., Berkeley. 1917.
- Kimball, F. E. A., Tucson, Ariz. 1924.
- Kimball, H. H., Seal Beach. 1909.
- King, Albert H., 3612 N. Griffin Ave., Los Angeles. 1920.
- King, Benjamin H., 1215 Lakeshore Drive, Coeur d'Alene, Idaho. 1921.
- Kirn, Albert J., R.D. 4, Solomon, Kas. 1918.
- Kitchin, E. A., 4014 N. 35th St., Tacoma, Wash. 1917.
- Kitt, W. Stanley, 129 S. 5th Ave., Tucson, Ariz. 1921.
- Kittridge, Joseph, Jr., care of Lake States Forest Exper. Sta., University Farm, St. Paul, Minn. 1915.
- Kloss, Philip, 24 Greenbank Ave., Piedmont. 1922.
- Kluegel, Mrs. Edward A., Carmel. 1916.
- Knapp, Elmer, Route No. 2, Troy, Penn. 1924.
- Knickerbocker, Chas. K., 445 N. Sacramento Ave., Carpenter Sta., Chicago, Ill. 1905.
- Knowlton, Dr. F. H., U. S. Nat. Museum, Washington, D. C. 1910.
- Kofoid, Prof. C. A., Zool. Dept., Univ. Calif., Berkeley. 1909.
- Kohler, Louis S., R.D. 2, Paterson, N. J. 1909.
- Krause, Helena, 820 26th St., San Diego. 1922.
- Krehbiel, Leonard, Box 193, Bishop. 1919.
- Kretzman, Prof. P. E., 3705 Texas Ave., St. Louis, Mo. 1914.
- Kuser, John Dryden, Bernardsville, N. J. 1912.
- Labarthe, Jules, 2727 Russell St., Berkeley. 1914.
- La Jeunesse, H. V., 2517 Webb St., Alameda. 1916.
- Lamb, Chester C., 235 W. 27th St., Los Angeles. 1899.
- Lancashire, Sarah (Mrs. J. Henry), Grafton Wood, Manchester, Mass. 1911.
- Langstroth, James H., P. O. Box D, Silver City, New Mexico. 1922.
- Lane, Geo. W., Morgan Hill. 1914.
- Langevin, Elmer, 325 S. Broadway, Crookston, Minn. 1922.
- Lano, Albert, 120 N. Block St., Fayetteville, Ark. 1920.
- Lastreto, C. B., 260 California St., San Francisco. 1913.
- \*§Law, J. Eugene, Altadena. 1900 (1915).
- \*§Law, Laura Beatty (Mrs. J. E.), Altadena. 1915 (1919).
- Lawrence, Mabel M., 1750½ W. 24th St., Los Angeles. 1921.
- Layne, J. Gregg, 619 Central Building, Los Angeles. 1912.
- Lazier, Prof. Edgar Locke, Reed College, Portland, Ore. 1924.
- Leach, Frank A., 217 Hillside Ave., Piedmont. 1917.
- Lee, Mrs. Melicent H., El Cajon. 1920.
- Lee, Ren M., 231 N. C St., Tulare. 1922.
- Leggett, Dr. R. M., 2140 9th Ave., San Francisco. 1918.
- Leland, H. J., 200 Currier Bldg., Los Angeles. 1897.
- Leopold, Aldo, care of Forest Products Lab., Madison, Wis. 1916.
- Libby, Miss Gretchen L., 310 2d Ave., Santa Barbara. 1911.
- Lien, Carl, Clallam Bay, Wash. 1917.
- Ligon, J. Stokley, Box 131, Albuquerque, N. M. 1914.
- Liliencrantz, H. T., Rancho Las Cimas, Hollister. 1916.
- Limbirt, R. W., Box 1284, Boise, Idaho. 1921.
- Lindemann, Miss W. C., 1435 8th St., Alameda. 1922.
- Lincoln, Frederick C., U. S. Biological Survey, Washington, D. C. 1922.
- Lindsay, Dr. D. Moore, 808 Boston Bldg., Salt Lake City, Utah. 1915.
- §Little, Luther, 1403 Garfield Ave., S. Pasadena. 1914.
- Littlejohn, Chase, 1226 Warren St., Redwood City. 1901.
- Livesey, Alice Rose, 373 W. California St., Glendale. 1921.
- Lloyd, Hoyes, 405 Queen St., Ottawa, Canada. 1923.
- Lombardi, Mrs. M. E., 2249 Piedmont Ave., Berkeley. 1916.
- Loring, J. Alden, Owego, Tioga Co., N. Y. 1914.
- §Love, Guy, Santee. 1913.
- Low, Mrs. Marion Ware, 1415 Crescent Ave., Hollywood. 1922.
- Lueders, Fred H. W., 516 E. Main St., Compton. 1923.
- Lunt, James C., 109 Liberty St., San Francisco. 1922.
- Lusk, Richard D., R. 2, Box 722, San Gabriel. 1915.
- Luther, Clarence H., 8 McIlroy Bldg., Fayetteville, Ark. 1909.

- MacKaye, David L., Tulare. 1922.
- McAtee, W. L., Biol. Survey, Washington, D. C. 1907.
- McBride, Everett F., care of R. T. McCracken, Lore City, Ohio. 1923.
- McCoy, Frank J., Santa Maria Inn, Santa Maria. 1923.
- McDaniel, George H., 234 W. Pratt St., Eureka. 1923.
- McGettigan, Carroll, 2644 Filbert St., San Francisco. 1921.
- \*McGregor, R. C., Bureau of Science, Manila, P. I. 1893 (1916).
- McGrew, Albert D., 5611 Stanton Ave., Pittsburgh, Pa. 1920.
- McKeough, Dr. Geo. T., Erie Manor, R.D. 1, Blenkerin, Ontario, Canada. 1922.
- McKibben, J. W., 2522 Piedmont Ave., Berkeley. 1921.
- McLain, R. B., Box 132, Hollywood. 1897.
- McLean, Donald D., Coulterville. 1916.
- McLean, Robert R., 2904 Granada St., San Diego. 1922.
- McLellan, Antonio, 309 San Francisco St., El Paso, Tex. 1920.
- McLellan, Miss Mary E., Calif. Academy of Sciences, San Francisco. 1919.
- McLeod, Kenneth, Jr., 2324 Vine St., Berkeley. 1923.
- McNeil, Ethel C. E., Pomona College, Claremont. 1924.
- Magee, William A., Jr., R.D. Fruitvale, Box 433, Oakland. 1912.
- Mailliard, Ernest C., Federal Reserve Bank, San Francisco. 1909.
- Mailliard, John W., 230 California St., San Francisco. 1894.
- \*Mailliard, Joseph, 1815 Vallejo St., San Francisco. 1895 (1920).
- Mannington, Joseph A., 1342 Detroit St., Los Angeles. 1923.
- Marshall, Dr. Benj. M., 2036 D St., Eureka. 1913.
- Martin, Mrs. Bertha Davis, 1644 Maltman Ave., Los Angeles. 1920.
- Martin, De Loach, 1223 S. Washington Ave., Marshall, Texas. 1916.
- Martz, Mrs. Warren H., 4601 Welch Pl., Los Angeles. 1924.
- Massey, Herbert, Ivy Lea, Burnage, Didsbury, Manchester, England. 1909.
- Maverick, Mrs. Lewis A., 4441 Burns Ave., Los Angeles. 1916.
- Mead, Mrs. Edwin B., 2618 Etna St., Berkeley. 1920.
- Meade, Mrs. Calvert, Box 161, Carmel. 1916.
- Meadows, Donald C., 231 N. Grand St., Orange. 1919.
- Meeker, Jesse C. A., Box 161, Danbury, Conn. 1907.
- Meister, H. D., Yoakum, Texas. 1909.
- \*Mershon, W. B., Saginaw, Mich. 1911 (1919).
- Mexia, Mrs. Ynes, 401 Medical Bldg., San Francisco. 1921.
- Michael, Chas. W., Yosemite. 1916.
- Middleton, R. J., Jeffersonville, Pa. 1918.
- Miller, Alden Holmes, 6066 Hayes Ave., Los Angeles. 1923.
- Miller, Mrs. Delphia S., 1523 Tonawanda Ave., Los Angeles. 1921.
- Miller, Frederic W., 935 S. Gaylord St., Denver, Colo. 1922.
- Miller, Dr. Loye Holmes, S. Branch, Univ. Calif., Los Angeles. 1905.
- Miller, Mary Mann, 5928 Hayes Ave., Los Angeles. 1920.
- Miller, Dr. R. C., Dept. Zoology, Univ. Calif., Berkeley. 1921.
- Miller, W. De Witt, Amer. Museum Nat. Hist., New York, N. Y. 1909.
- \*Mitchell, H. H., Prov. Museum, Normal School, Regina, Sask., Canada. 1915.
- Mitchell, Mrs. Irving J., 1127 W. 20th St., Los Angeles. 1924.
- Mitchell, Dr. Walton I., Paonia, Delta Co., Colo. 1909.
- Mix, Mrs. Arthur J., 1915 W. 8th St., Los Angeles. 1922.
- Moffitt, James, 2737 Webster St., San Francisco. 1917.
- Moore, Miss Nellie, 122 Falcon Ave., Long Beach. 1915.
- Moore, Robert T., 505 Slavin Bldg., Pasadena. 1911.
- Moran, R. B., 1318 S. Gramercy Place, Los Angeles. 1897.
- More, R. L., Vernon, Texas. 1911.
- Morley, Prof. S. Griswold, 2635 Etna St., Berkeley. 1916.
- Morse, Geo. W., 318 E. 9th St., Tulsa, Okla. 1922.
- Moxon, Cavendish, Box N, Los Altos. 1924.
- Mullen, James L., 1264 Logan Ave., Salt Lake City, Utah. 1915.
- Munro, J. A., 1060 St. David St., Oak Bay, Victoria, B. C., Canada. 1914.
- Murie, Olaus J., 219 7th Ave. S., Moorehead, Minn. 1913.
- Musgrave, Ethel Weatherford (Mrs. M. F.), Box 765, Phoenix, Ariz. 1921.
- Myers, Mrs. H. W., 311 N. Ave. 66, Los Angeles. 1912.
- Myers, Mabel Adelaide, 617 W. Center St., Anaheim. 1922.
- \*Nace, C. A., 171 W. Santa Clara St., San Jose. 1920 (1920).
- Nash, Herman W., Box 264, Pueblo, Colo. 1922.
- Naumburg, Mrs. Walter W., Hotel St. Regis, 5th Ave. and 55th St., New York City, N. Y. 1922.
- Neff, Johnson A., Marionville, Mo. 1920.
- Neilson, Mrs. Katherine, 1419 Versailles St., Alameda. 1920.
- Neilson, James Alexander, Wheatland High School, Wheatland, Wyoming. 1924.
- Newhall, Mrs. Chas. S., 2629 Piedmont Ave., Berkeley. 1916.
- Nice, Mrs. Margaret Morse, Norman, Okla. 1921.
- Nichols, J. T., Amer. Museum Nat. Hist., New York, N. Y. 1909.
- Nicholson, Donald J., Orlando, Fla. 1911.

- Nicholson, Gordon W., 7th St., Ontario. 1919.
- Niedrach, Robert J., 30 Pennsylvania St., Denver, Colo. 1922.
- Nienburg, Miss Matilda V., 2031 Alameda Ave., Alameda. 1922.
- Noack, H. R., 309 Perry St., Oakland. 1901.
- Nokes, Dr. I. D., 1120 Marsh-Strong Bldg., Los Angeles. 1914.
- Norris, Joseph Parker, Jr., 2122 Pine St., Philadelphia, Pa. 1911.
- Norris, Roy, 725 N. 10th St., Richmond, Ind. 1911.
- Norton, Arthur H., 22 Elm St., Portland, Me. 1918.
- Oberholser, Dr. Harry C., 2805 18th St., N. W., Washington, D. C. 1904.
- O'Farrell, Mrs. Mabel E., 2403 F St., San Diego. 1917.
- Ogden, Dr. H. V., 141 Wisconsin St., Milwaukee, Wis. 1924.
- Ohl, H. C., McKittick. 1913.
- Ohlendorf, W. C., 320 E. Stewart Ave., Park Ridge, Ill. 1910.
- Ortega, James L., Yountville, Napa Co. 1924.
- Orton, L. R., Fillmore. 1924.
- Osborne, Ernest Glenn, 161 W. 6th St., Claremont. 1924.
- Osgood, Dr. Wilfred H., Field Museum Nat. Hist., Chicago, Ill. 1893.
- Osincup, Clayton A., 30 W. Montana St., Pasadena. 1922.
- Osterhout, Geo. E., Windsor, Colo. 1915.
- Owen, Virgil W., 832 Beacon St., Los Angeles. 1896.
- Palmer, Miss Elizabeth Day, 1741 Harvard Blvd., Los Angeles. 1909.
- Palmer, R. H., Instituto Geologico, Mexico City, Mex. 1915.
- \*Palmer, Dr. T. S., 1939 Biltmore St., N. W., Washington, D. C. 1903 (1920).
- Pangburn, Clifford H., 299 Madison Ave., New York City, N. Y. 1920.
- Parcell, Miss Zulema L., 1633 Orange St., Los Angeles. 1919.
- Parker, Herbert, South Lancaster, Mass. 1911.
- Parmenter, Henry E., 317 E. Valeria St., Santa Barbara. 1916.
- Paroni, Miss Clelia A., 2430 Bancroft Way, Berkeley. 1920.
- Patterson, J. E., Box 478, Ashland, Ore. 1922.
- Patton, Dan, Midnapore, Alberta, Canada. 1924.
- Paul, Prof. J. H., 1320 E. 2d St. S., Salt Lake City, Utah. 1915.
- Paul, Lucius H., 436 Carter St., Rochester, N. Y. 1911.
- Paulson, Martin C., R.D. 5, Nevada, Ia. 1922.
- Peabody, Lloyd, 300 Globe Bldg., St. Paul, Minn. 1924.
- Peabody, Rev. P. B., Blue Rapids, Kan. 1904.
- Pearson, T. Gilbert, 1974 Broadway, New York, N. Y. 1910.
- Peck, Prof. Morton E., 244 N. 12th St., Salem, Ore. 1909.
- Pellew, Marior J., 1637 Massachusetts Ave., Washington, D. C. 1923.
- Pember, Karl A., Woodstock, Vermont. 1922.
- Pemberton, J. R., 1230 N. Vine St., Hollywood. 1900.
- Pennock, Chas. J., Kennett Square, Philadelphia, Pa. 1909.
- Penney, Chas. G., Ojai, Ventura Co. 1923.
- Perry, Mrs. Elinor B., 254 Main St., Hayward. 1924.
- Peterson, Hans C., P. O. Box 396, Reedley. 1924.
- \*Peyton, Laurence, R.D. 2, Fillmore. 1909 (1922).
- \*Peyton, Sidney B., Sespe. 1913 (1922).
- Phelps, Frank M., 212 E. 4th St., Elyria, Ohio. 1912.
- \*§Philipp, Philip Bernard, 220 Broadway, New York, N. Y. 1911 (1920).
- §Phillips, Dr. John C., Knobfields, Wenham, Mass. 1911.
- \*§Pierce, Wright M., Box 116, Claremont. 1902 (1919).
- Pierpont, Philip, Nordhoff. 1913.
- Pilsbury, Frank O., 1088 Main St., Walpole, Mass. 1911.
- Pitcher, Mrs. E. C., R. D. I, Box 273, Hayward. 1920.
- Poole, Cecil A., P. O. Box 262, Monmouth, Ore. 1924.
- Pope, E. F., Box 113, El Reno, Okla. 1913.
- Potter, Miss Jessica A., 1118 Santee St., Los Angeles. 1922.
- Powell, Miss Helen, Berkeley Inn, Telegraph and Haste Sts., Berkeley. 1914.
- Pratt, Helen S., 2451 Ridge View Ave., Eagle Rock. 1920.
- Price, A. E., Grant Park, Ill. 1905.
- Prill, Dr. A. G., Scio, Ore. 1921.
- \*Pringle, Miss Cornelia C., 1816 Vallejo St., San Francisco. 1915 (1922).
- Procter, James Norris, Box 188, Santa Paula. 1922.
- Purdy, William B., Milford, Mich. 1921.
- Quayle, Ernest Harrison, Box 4, Stanford University. 1924.
- Quillin, Roy W., 1025 Summit Ave., San Antonio, Texas. 1921.
- Raker, Mary E., 1484 E. Sherman St., Portland, Ore. 1919.
- Rand, F. L., 1108 Arcade Bldg., St. Louis, Mo. 1921.
- Randolph, Miss Flora A., 2962 Derby St., Berkeley. 1907.
- Rankin, Edward P., 1814 Marin Ave., Berkeley. 1913.
- Ransom, Webster H., 708 W. 20th Ave., Spokane, Wash. 1921.
- Rathbun, S. F., 217 14th Ave. N., Seattle, Wash. 1904.
- Rawson, Charles I., Oxford, Mass. 1918.
- Ray, Milton S., 118 New Montgomery St., San Francisco. 1899.
- Reid, Russell, 208 3d St., Bismark, N. Dak. 1921.
- Rett, Egmont J., Santa Barbara Mus. Comparative Oology, Mission Canyon, Santa Barbara. 1922.



- Reis, C. Oscar, 647 Juanita Ave., Los Angeles. 1917.
- Rich, Dr. Guy C., 1820 El Cerrito Place, Hollywood. 1911.
- Rich, Selwyn, Box 55, Claremont. 1919.
- Rich, Waldo L., Saratoga Springs, N. Y. 1919.
- Richards, E. B., 128 Chester St., Grass Valley. 1909.
- Richards, Dr. T. W., U. S. N., 1724 P St., N.W., Washington, D. C. 1908.
- Richards, W. W., Room 708, 717 Market St., San Francisco. 1915.
- Richardson, W. D., 4215 Prairie Ave., Chicago, Ill. 1918.
- §Richmond, Dr. Chas. W., U. S. Nat. Museum, Washington, D. C. 1904.
- Richmond, Frank, care Richmond Bros., El Centro. 1920.
- Rigdon, Dr. R. L., 1617 Broderick St., San Francisco. 1921.
- Riley, J. H., U. S. Nat. Museum, Washington, D. C. 1909.
- Rittenhouse, Prof. Samuel, Univ. S. Cal., Los Angeles. 1916.
- Ritter, Prof. W. E., Hotel Whitecotton, Berkeley. 1901.
- Roberts, Dr. T. S., Zoological Museum, Univ. Minn., Minneapolis, Minn. 1909.
- Robertson, Howard, 157 Wilton Drive, Los Angeles. 1896.
- §Robertson, John McB., R.D. 1 Box 13, Buena Park, Orange Co. 1913.
- Robertson, Mrs. John McB., Buena Park. 1920.
- Roe, Mrs. E. D., Pelton Water Wheel Co., 19th and Harrison Sts., San Francisco. 1919.
- Ross, Roland C., 388 Dearborn St., Pasadena. 1920.
- Rowan, Wm., Dept. Zool., Univ. Alberta, Edmonton, Alta., Canada. 1921.
- Rowley, J., 403 S. 1st St., Alhambra. 1909.
- Rush, Miss Lora Gertrude, 1607 Walnut St., Berkeley. 1920.
- Russell, Carl P., P. O. Box 153, Yosemite. 1923.
- Rust, Henry J., Box 683, Coeur d'Alene, Idaho. 1911.
- Sage, Jno. H., Portland, Conn. 1910.
- Sampson, W. B., 1005 N. San Joaquin St., Stockton. 1894.
- Sanborn, Colin Campbell, Field Museum Nat. Hist., Chicago, Ill. 1924.
- Sanderson, Miss Dorothy, 1217 McCadden Pl., Los Angeles. 1922.
- Sanford, Dr. Leonard C., 347 Temple St., New Haven, Conn. 1915.
- Sanford, W. H., 919 W. Acacia St., Stockton. 1915.
- Saunders, Aretas A., 48 Longview Ave., Fairfield, Conn. 1909.
- Saunders, Mrs. Kenneth, Creston Road, High Acres, Berkeley. 1920.
- Saunders, W. E., London, Ont., Canada. 1910.
- Schafer, Oscar F., 669 Genesee St., Rochester, N. Y. 1917.
- Schenck, W. Egbert, 17 Panoramic Way, Berkeley. 1924.
- Schenck, Sara M. (Mrs. W. Egbert), 17 Panoramic Way, Berkeley. 1924.
- Schleichert, Ernest K., Mathias Point, Va. 1919.
- Schlesinger, Mrs. Jane L., 1417 Filbert St., Oakland. 1915.
- Schneider, Fred A., care Warren Dried Fruit Co., San Jose. 1901.
- Schneider Mrs. G. H., 4618 Kingswell Ave., Los Angeles. 1921.
- §Schneider, J. J., Box 363, Anaheim. 1899.
- Schussler, Geo. W., 1345 Oak St., San Francisco. 1911.
- Sclater, William Lutley, 10 Sloane Court, London, S. W., England. 1909.
- Scott, Carroll DeWilton, 1604 7th St., San Diego. 1915.
- Sefton, J. W., Jr., 650 F St., San Diego. 1923.
- Seymour, Mrs. Geo. H., 101 N. Kennilworth Ave., Oak Park, Ill. 1922.
- Shafer, Thomas Guy, 2101 23d Ave., Oakland. 1923.
- Sharp, Clarence S., Escondido. 1902.
- Sharples, Mrs. J. M., Juneau, Alaska. 1924.
- Sharples, Robert F., West Chester, Pa. 1911.
- Shaw, Prof. W. T., Box 66, College Sta., Pullman, Wash. 1911.
- Sheldon, Harry H., care Commercial Tr. & Savgs. Bank, Santa Barbara. 1922.
- Shelton, Alfred C., Johnston-Shelton Co., Dayton, Ohio. 1909.
- Shepard, John Alden, Route A, Morgan Hill. 1919.
- Shepherd, A. R., 457 W. Burchett St., Glendale. 1920.
- Shepherd, Mrs. Hattie E., R. R. 1, Box 73, Redlands. 1921.
- \*§Sherman, Althea R., National, via McGregor, Iowa. 1911 (1916).
- Sherwood, Jack, Box 264, Salinas. 1923.
- Sherwood, Wm. E., 787 Cross St., Salem, Ore. 1923.
- Shiras, George, 3d, Stoneleigh Court, Washington, D. C. 1914.
- Silliman, Edmund, Alisal and Ryker Sts., Salinas. 1918.
- Silliman, O. P., 220 Salinas St., Salinas. 1893.
- Simonds, Dr. Paul E., 304 Loring Bldg., Riverside. 1922.
- Simpson, Roger G., 2622 Dana St., Berkeley. 1924.
- Sinsel, Joseph A., 612 Pleasant Ave., Yakima, Wash. 1924.
- \*Skinner, M. P., Summerville, So. Carolina. 1915 (1920).
- Slack, Mrs. Nina M., 608 Prospect Ave., So. Pasadena. 1923.
- Sloanaker, Jos. L., 907 W. Mansfield Ave., Spokane, Wash. 1910.
- Smith, Allyn G., 1825 Hopkins St., Berkeley. 1909.
- Smith, Austin Paul, Apartado 412, San Jose, Costa Rica. 1907.
- Smith, A. Russell, Mt. Carmel Ave., North Glenside, Penn. 1919.



- Smith, Chas. Piper, 354 So. 10th St., San Jose. 1923.
- Smith, C. R., 563 42d Ave., San Francisco. 1917.
- Smith, Miss Emily, Route 1, Box 56, Los Gatos. 1924.
- Smith, Prof. Frank, 1005 W. California Ave., Urbana, Ill. 1911.
- Smith, Franklin J., Box 98, Eureka. 1913.
- Smith, Horace G., 2918 Lafayette St., Denver, Colo. 1914.
- Smith, Napier, Bank of Montreal, Verdun, Quebec, Canada. 1919.
- Smoll, P. A., 822 Monument St., Colorado Springs, Colo. 1922.
- Smyth, Mrs. W. H., Fernwald, head of Dwight Way, Berkeley. 1918.
- Snow, Mrs. Oscar, Messilla Park, New Mexico. 1924.
- Snyder, Prof. J. O., Box 775, Stanford University. 1900.
- Snyder, L. L., Royal Ontario Museum Zool., Toronto, Ont., Canada. 1924.
- Spaulding, Prof. M. Herrick, Agr. Coll., Bozeman, Mont. 1918.
- Spaulding, Manfred Kenwood, Box 984, Westwood. 1924.
- Stacey, John William, 645 Leavenworth St., San Francisco. 1921.
- Stafford, John LeMoyné, Box 128, Gresham, Ore. 1924.
- Stafford, Walter A., 31 Park Way, Piedmont. 1917.
- Stahl, Charlotte, 955 So. Alvarado St., Los Angeles. 1924.
- Stanford, Miss Mabel A., Box 124, Claremont. 1921.
- Staub, Henry A., care of Varney Bros., El Centro. 1924.
- Steinbeck, William, 1029 N. Hunter St., Stockton. 1897.
- Stephens, T. C., Morningside College, Sioux City, Iowa. 1914.
- Stephenson, Miss Omie, Monte Vista, Colo. 1922.
- Stivers, Dr. C. G., 406 Auditorium Bldg., Los Angeles. 1914.
- Stoddard, H. L., Beachton, Grady Co., Ga. 1914.
- Stone, Geo. E., Box 371, Carmel. 1912.
- Stone, D. D., R.D. 3, Oswego, N. Y. 1909.
- Stone, Dr. Witmer, Academy Nat. Sciences, Logan Circle, Philadelphia, Pa. 1924.
- Stoner, Emerson A., Box 444, Benicia. 1918.
- Storer, Miss Mary S., 467 San Pablo Ave., Fresno. 1914.
- Storer, Prof. Tracy I., University Farm, Davis. 1910.
- Stormont, W. P., 219 W. Ave. 51, Los Angeles. 1917.
- Stow, Harry P., 1617 Central Ave., Alameda. 1921.
- Streator, Clark P., 16 Mason St., Santa Cruz. 1919.
- \*§Strong, W. A., 41 Grand Ave., San Jose. 1912 (1920).
- Strong, Wm. Duncan, 2220 Piedmont Ave., Berkeley. 1921.
- Stuart, Geo. H., 3d, 923 Clinton St., Philadelphia, Pa. 1913.
- Stuart, Morton, U. S. Forest Service, Santa Barbara. 1924.
- Sugden, J. W., 47 S. 8th W. St., Salt Lake City, Utah. 1915.
- Sumner, E. L., Jr., 1375 So. Palomares St., Pomona. 1924.
- Swales, B. H., U. S. Nat. Museum, Washington, D. C. 1898.
- §Swarth, Harry S., Museum Vert. Zool., Berkeley. 1897.
- Sweeney, Joseph A., U. S. Forest Service, Nenzel, Neb. 1912.
- Swenk, Prof. Myron Harmon, 1410 N. 37th St., Lincoln, Neb. 1916.
- Tanner, V. M., Dixie Normal Coll., St. George, Utah. 1919.
- Tate, Ralph C., Kenton, Okla. 1924.
- Taverner, P. A., Zool. Div., Geol. Survey, Ottawa, Ont., Canada. 1909.
- Taylor, E. F., Grass Valley, Nevada Co. 1910.
- Taylor, Mrs. H. J., 1711 Douglas St., Sioux City, Iowa. 1920.
- Taylor, Jesse H., 210 Myrtle Ave., Eagle Rock. 1919.
- Taylor, L. E., R.D. 2, Reno, Nev. 1897.
- Taylor, Lionel V., Kelowna, B. C., Canada. 1921.
- Taylor, Dr. Walter P., Box 402, University Station, Tucson, Ariz. 1905.
- Teachenor, Dix., 510 Rialto Bldg., Kansas City, Mo. 1922.
- Tenney, Vernon L., 2536 Etna St., Berkeley. 1922.
- Terrill, L. McL., 44 Stanley Ave., St. Lambert, Que., Canada. 1911.
- Test, Dr. Louis A., 222 North St., W. Lafayette, Ind. 1908.
- \*§Thayer, John E., Box 98, Lancaster, Mass. 1906 (1914).
- Thomas, Geo. C., 3rd, 1014 Crescent Drive, Beverly Hills. 1922.
- Thomas, Granville E., 1533 Spruce St., Berkeley. 1923.
- Thompson, Albert E., Box 712, Blythe. 1923.
- Thompson, Mrs. H. F., 817 S. Spring St., Los Angeles. 1922.
- Thompson, J. Walcott, 527 E. 1st S. St., Salt Lake City, Utah. 1918.
- Thomson, Miss Isabel A., 5939 Shafter Ave., Oakland. 1918.
- Thowless, Herbert L., 255 Fourth St., Newark, N. J. 1919.
- Tindall, Charles W., 912 N. Noland St., Independence, Mo. 1920.
- Todd, W. E. Clyde, Carnegie Museum, Pittsburgh, Pa. 1909.
- Tonkin, George, Biol. Survey, Baker, Ore. 1920.
- Torrey, Frederic C., 1 Canyon Road, Berkeley. 1921.
- Treganza, A. O., 522 S. 13th St. E., Salt Lake City, Utah. 1907.
- Treganza, Mrs. A. O., 522 S. 13th St. E., Salt Lake City, Utah. 1915.

- Trenor, Thomas, Hotel Congress, San Francisco. 1913.
- Trescot, E. B., R.D. 4, Box 221, Petaluma. 1915.
- Trewhella, James S., Montebello. 1922.
- Trippe, Thomas M., Howardsville, Colo. 1911.
- Trost, Henry, 475 29th St., San Francisco. 1924.
- Trumbull, J. H., 39 Farmington Ave., Plainville, Conn. 1911.
- Turnbull, James Douglas, 2065 48th Ave. West, Vancouver, B. C. 1923.
- \*Tyler, John G., P. O. Box 173, Fresno. 1905 (1920).
- Tyler, Dr. Winsor M., 522 Massachusetts Ave., Lexington, Mass. 1914.
- Unglish, W. E., Gilroy. 1910.
- Van Cleve, H. R., 539 Mer. Nat. Bank Bldg., Los Angeles. 1922.
- Van Denburgh, Dr. John, 240 Stockton St., San Francisco. 1916.
- Van Fleet, Clark C., Box 468, Santa Rosa. 1906.
- Van Gaasbeek, Miss Florence M., 2429 Channing Way, Berkeley. 1921.
- §Van Rossem, Adriaan 3459 S. Arlington St., Los Angeles. 1909.
- \*Van Straaten, H., Het Veldhuis, 8 Denneweg, Velp, Holland. 1918 (1919).
- Varick, Wm. Remsen, San Marcus Bldg., Santa Barbara. 1923.
- Vornies, Prof. Chas. T., Univ. Ariz., Tucson, Ariz. 1916.
- Wagner, Edward H., 527 San Joaquin St., Stockton. 1922.
- Walker, Alex., Tillamook, Ore. 1911.
- Walker, Ernest P., Biol. Survey, Juneau, Alaska. 1910.
- Wanzer, James Olin, City Manager, Marysville. 1921.
- Ward, F. H., 18 Grove Place, Rochester, N. Y. 1915.
- Warmer, Charles A., 1310 Baker-Detwiler Bldg., Los Angeles. 1920.
- Warmer, Mrs. Edna R., 2549 Beechwood Drive, Los Angeles. 1921.
- Warren, E. R., 1511 Wood Ave., Colorado Springs, Colo. 1909.
- Waterhouse, John Thomas, care Alexander and Baldwin, Ltd., Honolulu, T. H. 1921.
- Weber, J. A., 151 Grand Ave., Leonia, N. J. 1915.
- Webster, Mrs. Lawrence J., Holderness, New Hampshire. 1923.
- Wegeforth, Dr. Harry M., 210 Maple St., San Diego. 1920.
- Wegener, Miriam (Mrs. H. A.), 506 N. 3rd St., Alhambra. 1924.
- Weiser, Charles S., 101 W. Springettsburg Ave., York, Pa. 1920.
- Welch, L. W., 1845 Olive Ave., Long Beach. 1911.
- Welsh, Joseph, Pasadena Hdw. Co., Pasadena. 1917.
- Wetmore, Dr. Alexander, Biol. Survey, Washington, D. C. 1909.
- Wheeler, Mrs. J. W., 403 15th Ave. N., Seattle, Wash. 1912.
- Wheeler, Roswell S., 4017 Everett Ave., Oakland. 1894.
- White, Halsted G., 528 San Luis Road, Berkeley. 1914.
- Whitney, Miss Margaret W., 1563 N. Raymond Ave., Pasadena. 1919.
- Whittle, Charles L., 50 Congress St., Boston, Mass. 1922.
- Widmann, Berthold, 4621 Wesley Ave., Los Angeles. 1923.
- Widmann, O., 5105 Enright Ave., St. Louis, Mo. 1904.
- Wilder, H. E., Carlotta, Humboldt Co. 1909.
- Willard, B. G., 51 Fresh Pond Parkway, Cambridge, Mass. 1910.
- \*§Willard, F. C., Farmingdale, Long Island, N. Y. 1905.
- Willett, Geo., Ketchikan, Alaska. 1905.
- Williams, Robert W., Tallahassee, Fla. 1914.
- Wilson, Rev. Francis M., Beaumont. 1921.
- Wilson, Gordon, 1434 Chestnut St., Bowling Green, Kentucky. 1924.
- Withey, George C., Deering, North Dakota. 1924.
- Wolfe, Lieut. L. R., Camp Alfred Vail, New Jersey. 1921.
- Wood, Dr. Casey A., 7 West Madison St., Chicago, Ill. 1916.
- Wood, Dr. Clifford H., Glendora. 1922.
- Wood, Mrs. Mildred Tiffany, Hyampom, Trinity Co. 1921.
- Wood, Norman A., Museum Zool., Ann Arbor, Mich. 1916.
- Woodruff, Frank M., Chicago Acad. Sciences, Chicago, Ill. 1906.
- Woodruff, Regina, Whittier College, Whittier. 1920.
- Woods, Robert S., 919 S. Bonnie Brae, Los Angeles. 1920.
- Woodward, C. H., 4129 Ingalls St., San Diego. 1920.
- \*Wright, Curtis, 2943 Avalon Ave., Berkeley. 1916.
- §Wright, Frank S., 14 Cayuga St., Auburn, N. Y. 1910.
- Wright, Howard W., 830 N. Orange Grove Ave., Pasadena. 1921.
- Wright, William S., Nat. Hist. Museum, Balboa Park, San Diego. 1924.
- \*Wyman, L. E., Museum Hist., Sci., and Art, Los Angeles. 1908 (1920).
- Wythe, Margaret W., Museum Vert. Zool., Berkeley. 1912.
- Yost, Mrs. Myrtle K., 2831 N. Broadway, Los Angeles. 1923.
- Zahn, Otto J., 2115 Estrella Ave., Los Angeles. 1896.
- Zahn, Mrs. Francis M. Harmon, 2115 Estrella Ave., Los Angeles. 1912.
- Zech, Miss Lillian, 335 W. Highland Ave., Redlands. 1916.
- Zerlang, John, 2634 F St., Eureka. 1918.
- Zerlang, Lawrence, 524 W. Hawthorne St., Eureka. 1918.
- Zinn, Zola, 4002 39th St. S. W., Seattle, Wash. 1921.





List of species, and the number of each, banded in the Western Province during the year which began March 1, 1923, and ended February 29, 1924.

Pigeon Guillemot .....	1	Red-backed Junco .....	12
Glaucous-winged Gull .....	52	Pink-sided Junco.....	17
Ashy Petrel .....	1	Rufous-crowned Sparrow .....	5
Mallard .....	6	Song Sparrow .....	100
Green-winged Teal .....	2	Lincoln Sparrow .....	1
Pintail .....	22	Fox Sparrow .....	60
Valley Quail .....	106	Spurred Towhee .....	46
Mourning Dove .....	5	Brown Towhee .....	86
Screech Owl .....	2	Green-tailed Towhee .....	6
Sparrow Hawk .....	3	Black-headed Grosbeak .....	23
Flicker (group) .....	12	Cliff Swallow .....	4
Western Kingbird .....	4	Tree Swallow .....	7
Say Phoebe .....	1	Violet-green Swallow .....	5
Black Phoebe .....	8	Bohemian Waxwing .....	9
Steller Jay .....	7	Phainopepla .....	2
California Jay .....	9	California Shrike .....	1
Woodhouse Jay .....	5	Gray Vireo .....	3
Western Crow .....	3	Virginia Warbler .....	1
Northwestern Crow .....	5	Yellow Warbler .....	3
Cowbird .....	1	Audubon Warbler .....	5
Bicolored Redwing .....	12	Macgillivray Warbler .....	2
Western Meadowlark .....	8	Pileolated Warbler .....	4
Hooded Oriole .....	6	Dipper .....	3
Brewer Blackbird .....	2	Western Mockingbird .....	18
Bronzed Grackle .....	1	Catbird .....	1
Evening Grosbeak .....	2	California Thrasher .....	13
Cassin Purple Finch .....	10	Canyon Wren .....	3
House Finch .....	402	Vigors Wren .....	9
Willow Goldfinch .....	3	House Wren .....	12
Arkansas Goldfinch .....	11	Slender-billed Nuthatch .....	1
Pine Siskin .....	4	Plain Titmouse .....	5
Vesper Sparrow .....	2	California Bush-Tit .....	4
Lark Sparrow .....	4	Wren-Tit .....	48
White-crowned Sparrow .....	338	Willow Thrush .....	1
Golden-crowned Sparrow .....	215	Russet-backed Thrush .....	1
White-throated Sparrow .....	1	Hermit Thrush .....	13
Chipping Sparrow .....	4	Robin .....	39
Black-chinned Sparrow .....	3	Western Bluebird .....	5
Oregon Junco .....	133	Mountain Bluebird .....	6

Total species ..... 78

Total individuals ..... 2105

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